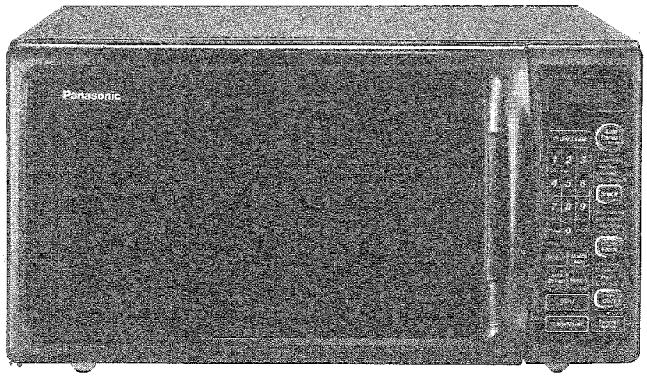
ORDER NO. MMOC9801038C1
E1

Service Manual

Microwave Oven



NN-L628BA, NN-L728BA (Black)

MODELS	APH
	USA
NN-L538BA	○
NN-L538WA	○
NN-L628BA	○
NN-L628WA	○
NN-L638BA	○
NN-L638WA	○
NN-L728BA	○
NN-L738BA	○

Specifications:

Models:	NN-L538BA/WA	NN-L628BA/WA, NN-L638BA/WA	NN-L728BA, NN-L738BA
Power Source:	120 V AC Single Phase, 60 Hz	120 V AC Single Phase, 60 Hz	120 V AC Single Phase, 60 Hz
Power Requirements:	1550W (13.5A)	1550W (13.5A)	1580W (13.8A)
Output: (IEC705-88)	1000W	1000W	1000W
Microwave Frequency:	2,450MHz	2,450MHz	2,450MHz
Timer:	99 min. 99 sec.	99 min. 99 sec.	99 min. 99 sec.
Oven Cavity Size:	1.0 cu. ft.	1.3 cu. ft.	1.7 cu. ft.
Outside Dimensions:	20" (W) X 14 3/16" (D) X 12" (H) 510mm (W) X 360mm (D) X 306mm (H)	21 7/8" (W) X 16 3/4" (D) X 12" (H) 555mm (W) X 425mm (D) X 306mm (H)	23 7/16" (W) X 16 3/4" (D) X 14" (H) 595mm (W) X 425mm (D) X 356mm (H)
Inside Dimensions:	13 7/8" (W) X 13 5/16" (D) X 9" (H) 353mm (W) X 338mm (D) X 229mm (H)	14 15/16" (W) X 15 13/16" (D) X 9 1/8" (H) 380mm (W) X 402mm (D) X 232mm (H)	17 3/16" (W) X 15 9/16" (D) X 10 11/16" (H) 437mm (W) X 396mm (D) X 272mm (H)
Weight:	34 lbs/15.3 kg	38 lbs/17.2 kg	40 lbs/18 kg
Output power: IEC705-88 Test procedure			
Specifications subject to change without notice			

Panasonic®

© 1998 Matsushita Electric Industrial Co., Ltd.
All rights reserved. Unauthorized copying and distribution is a violation of law.

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

WARNING

1. This product should be serviced only by trained qualified personnel.
2. Though this product has been manufactured in compliance with:
   "Federal Performance Standard 21 CFR Subchapter J" (D.H.H.S.): U.S.A. models
   or "Radiation Emitting Devices Act" (Health and Welfare Canada): Canadian models
   it is very important all repairs should be made in accordance with procedures described in this manual to avoid being exposed to excessive microwave radiation.
3. Check for radiation leakage before and after every servicing according to the "procedure for measuring radiation leakage".
4. If the unit cannot be repaired on site, advise the customer not to use until unit is repaired.
5. Any serviceman who learns of any accident pertaining to microwave radiation leakage including the oven operating with open door should immediately notify the appropriate address listed below and Center for Devices and Radiological Health, DHHS.

IN U.S.A. (PASC)	Panasonic Services Company 50 Meadowland Parkway, Secaucus, New Jersey 07094 Attention: Technical Service Division. (201) 348-7000	IN PUERTO RICO (PSC)	PSC San Gabriel Industrial Park 65th Infantry Ave. Km.9.5 Carolina, Puerto Rico 00985 (787)750-4300
		IN CANADA (PCI)	Panasonic Canada Inc. 5770 Ambler Drive, Mississauga, Ontario, L4W2T3 (905) 624-5010

6. There are special components used in the microwave oven which are important for safety. These parts are marked with a ⚠ on the replacement parts list. It is essential that these critical parts should be replaced only with the manufacturer's specified parts to prevent microwave leakage, shock, fire, or other hazards. Do not modify the original design.

PRECAUTIONS TO BE OBSERVED BEFORE AND DURING SERVICING TO AVOID POSSIBLE EXPOSURE TO EXCESSIVE MICROWAVE ENERGY

(A) Do not operate or allow the oven to be operated with the door open.
(B) Make the following safety checks on all ovens to be serviced before activating the magnetron or other microwave source, and make repairs as necessary:
   (1) Interlock operation
   (2) Proper door closing
   (3) Seal and sealing surfaces (arcing, wear, and other damage)
   (4) Damage to or loosening of hinges and latches.
   (5) Evidence of dropping or abuse
(C) Before turning on microwave power for any service test or inspection within the microwave generating compartments, check the magnetron, waveguide or transmission line, and cavity for proper alignment, integrity and connections.
(D) Any defective or misadjusted components in the interlock, monitor, door seal, and microwave generation and transmission systems shall be repaired, replaced, or adjusted by procedures described in this manual before the oven is released to the owner.
(E) A microwave leakage check to verify compliance with the Federal Performance Standard should be performed on each oven prior to release to the owner.

CONTENTS

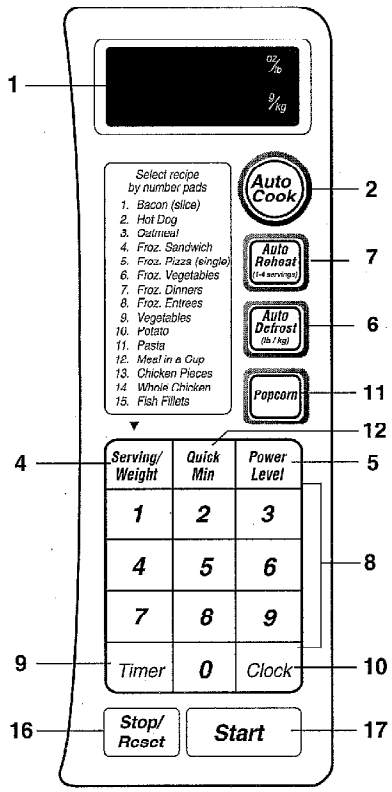
	(page)		(page)
FEATURE CHART	3	COMPONENT TEST PROCEDURE	13
CONTROL PANELS	3	MEASUREMENTS AND ADJUSTMENTS	15
OPERATION AND DIGITAL PROGRAMMER CIRCUIT TEST PROCEDURE	5	PROCEDURE FOR MEASURING MICROWAVE ENERGY LEAKAGE	16
SCHEMATIC DIAGRAM	7	TROUBLESHOOTING GUIDE	17
DESCRIPTION OF OPERATING SEQUENCE	8	EXPLODED VIEW AND PARTS LIST	20
CAUTIONS TO BE OBSERVED WHEN TROUBLESHOOTING	9	PARTS LIST OF DIGITAL PROGRAMMER CIRCUIT & SCHEMATIC DIAGRAM	27
DISASSEMBLY AND PARTS REPLACEMENT PROCEDURE	10		

FEATURE CHART

FEATURES	USA Models		
	NN-L628BA/WA NN-L728BA	NN-L538BA/WA NN-L638BA/WA	NN-L738BA
Three Stage Cooking	○	○	○
Auto Cook	○	○	○
Auto Defrost	○	○	○
Auto Reheat	○	○	○
Auto Cooking Display #	○	○	○
Popcorn	○	○	○
Quick Minute	○	○	○
Child Safety Lock	○	○	○
Delay Start	○	○	○
Timer	○	○	○
Digital Clock	○	○	○
Memory	○	○	—

CONTROL PANELS

NN-S738BA



1 Display Window
2 Auto Cook Pad & Selections
4 Serving Weight Pad
5 Power Level Pad
6 Auto Defrost Pad
7 Auto Reheat Pad
8 Number Pads
9 Timer Pad
10 Clock Pad
11 Popcorn Pad
12 Quick Minute Pad
16 Stop/Reset Pad

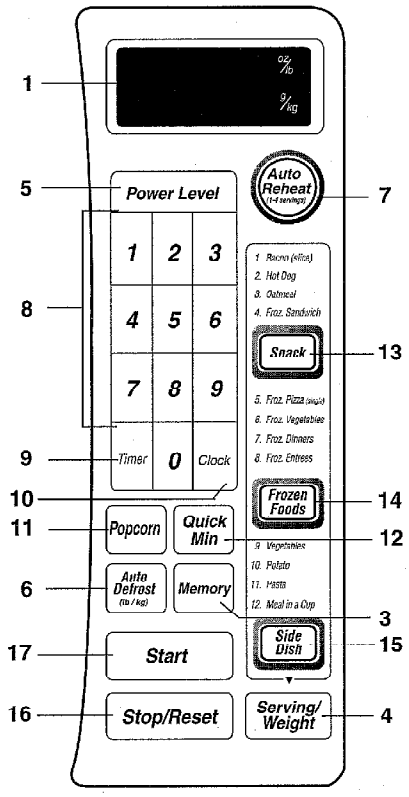
Before cooking: One tap clears your instructions. During cooking: One tap temporarily stops the cooking process. Another tap cancels all your instructions in the display window.

17 Start Pad

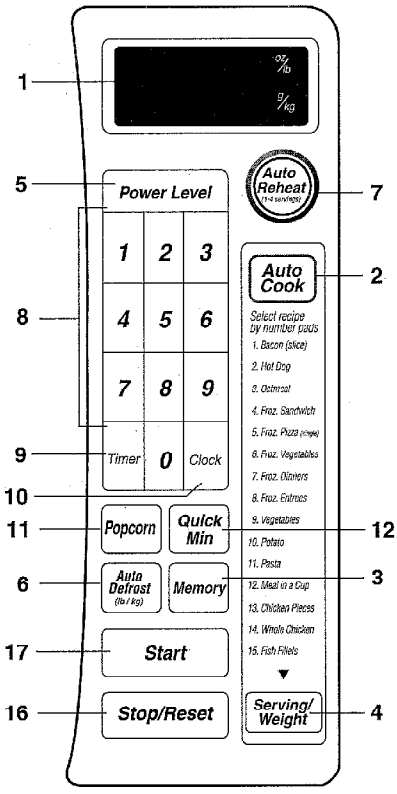
One tap allows oven to begin functioning. If door is opened or STOP/RESET Pad is pressed once during oven operation, START Pad must again be pressed to restart oven.

CONTROL PANELS

NN-L628BA/WA
NN-L728BA



NN-L538BA/WA
NN-L638BA/WA



1 Display Window
2 Auto Cook Pad & Selections
3 Memory Pad
4 Serving Weight Pad
5 Power Level Pad
6 Auto Defrost Pad
7 Auto Reheat Pad
8 Number Pads
9 Timer Pad
10 Clock Pad
11 Popcorn Pad
12 Quick Minute Pad
13 Snack Pad & Selections
14 Frozen Foods Pad & Selections
15 Side Dish Pad & Selections
16 Stop/Reset Pad

Before cooking: One tap clears your instructions.
During cooking: One tap temporarily stops the cooking process. Another tap cancels all your instructions in the display window.

17 Start Pad

One tap allows oven to begin functioning. If door is opened or STOP/RESET Pad is pressed once during oven operation, START Pad must again be pressed to restart oven.

OPERATION AND DIGITAL PROGRAMMER CIRCUIT TEST PROCEDURE

lb/kg Conversion: The oven automatically displays the lbs/oz symbol when using Auto Defrost feature etc. If you wish to use the kg/g, press Start Pad directly after plugging the oven in but before setting the clock.

1. To Set Clock

OPERATION	DISPLAY
1. Plug the power supply cord into wall outlet.	88.88
2. Press [Clock] pad.	✳
3. Enter time of day (TOD) by pressing appropriate [Number] pads.	11✳25
4. Press [Clock] pad. TOD has now been registered into the digital programmer circuit and will count up by minutes.	11.25

2. Time Cooking for Two Stage

OPERATION	DISPLAY
1. Place a water load in the oven.	
2. Press [Power Level] pad once to set High power. (1st stage)	P100
3. Set for 5 seconds by pressing [Number] pad. 5 sec. = [5]	. 5
4. Press [Power Level] pad 4 times to set Medium power. (2nd Stage)	P 50
5. Set for 1 minute by pressing [Number] pads. 1 min. = [1] [0] [0]	1.00
6. Press [Start] pad. 1st stage cooking begins as time counts down.	✳ 5
7. When 1st stage cooking time has elapsed, oven beeps twice and automatically switches to 2nd stage cooking.	1✳00
8. When 2nd stage cooking time has elapsed, oven beeps 5 times and shuts off. Dot or TOD, if set, reappears on the display.	11.25

3. Auto Defrost

OPERATION	DISPLAY
1. Press [Auto Defrost] pad.	A.dEF — ✳
2. Set the weight for 3 lb by pressing [3] and [0] pads.	— 3.0
3. Press [Start] pad. Auto Defrost cycle begins as time counts down.	NN-L538BA/WA → 32✳00 NN-L628BA/WA, NN-L638BA/WA → 27✳30 NN-L728BA, NN-L738BA → 25✳30
4. When defrost time has elapsed, oven beeps 5 times and shuts off. Dot or TOD, if set, reappears on the display.	11.25

4. Auto Reheat

OPERATION	DISPLAY
1. Press Auto Reheat pad twice for two servings.	2
2. Press Start pad. Auto Reheat cycle begins as time counts down. NN-L538BA/WA → NN-L628BA/WA, NN-L638BA/WA → NN-L728BA, NN-L738BA →	 4:30 3:40 3:00
3. When cooking time has elapsed, Oven beeps 5 times and shuts off. Dot or TOD, if set, reappears on the display.	11.25

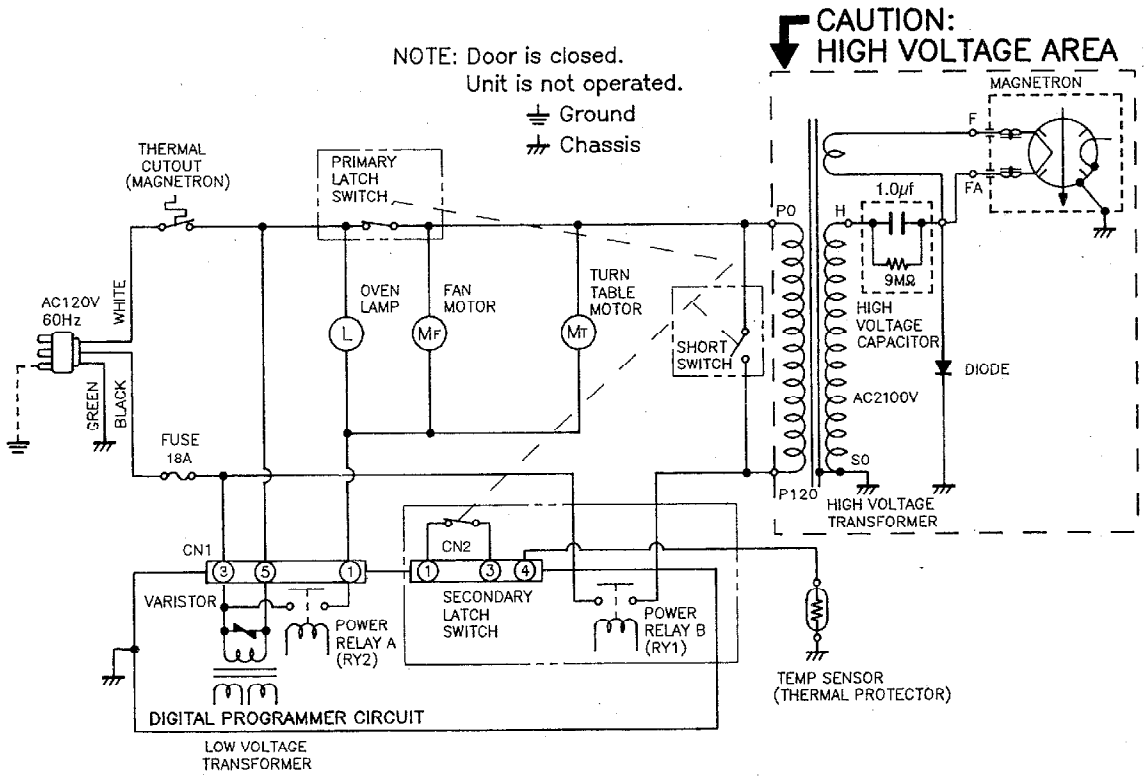
5. To Set Child Lock

OPERATION	DISPLAY
1. Press Start pad 3 times continuously. *Child* appears on the display. (You can set Child Lock when TOD is set or Dot is on the display.)	Child

6. To Reset Child Lock

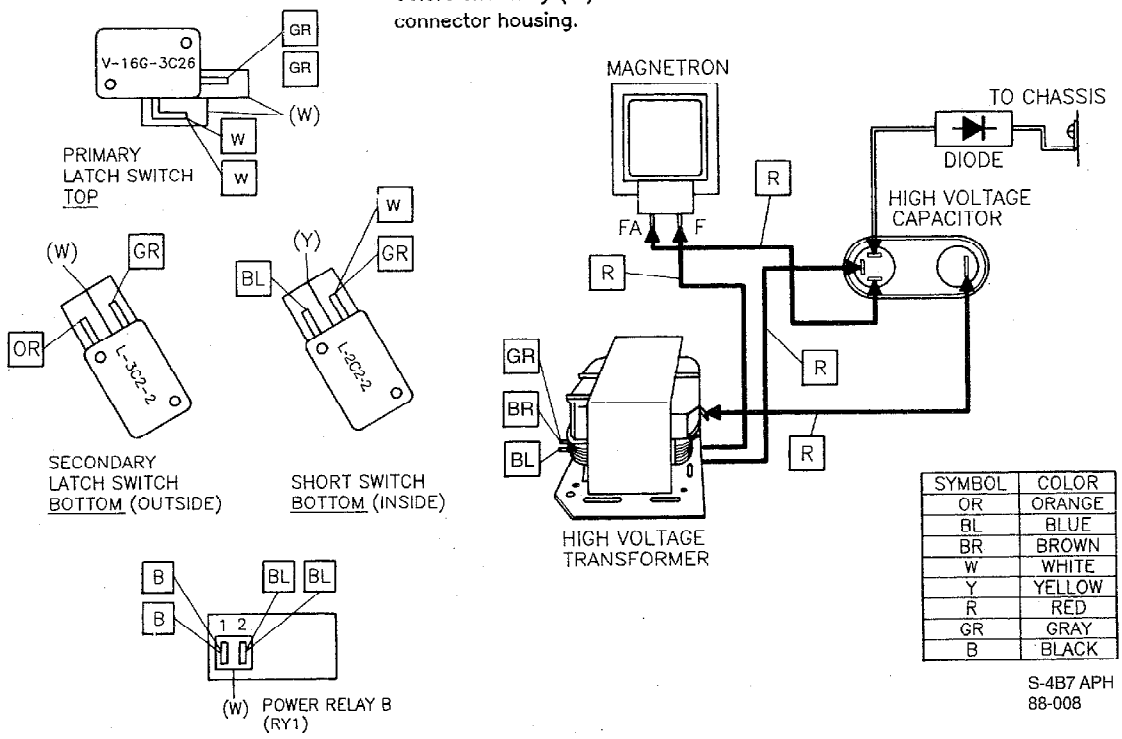
OPERATION	DISPLAY
1. Press Stop/Reset pad 3 times continuously. Dot or time of day, if set, appears on the display.	11.25

SCHEMATIC DIAGRAM (APH)



WIRING DIAGRAM

NOTE: *When replacing, check the lead wire color as shown.
*Colors shown by ( ) indicate colors of lead wire connector housing.



SYMBOL	COLOR
OR	ORANGE
BL	BLUE
BR	BROWN
W	WHITE
Y	YELLOW
R	RED
GR	GRAY
B	BLACK

S-4B7 APH
88-008

DESCRIPTION OF OPERATING SEQUENCE

1. Variable power cooking control

The coil of power relay B (RY1) is energized intermittently by the digital programmer circuit, when the oven is set at any power selection except for High power position. The digital programmer circuit controls the ON-OFF time of power relay B contacts in order to vary the output power of the microwave oven from "Low" to "High" power. One companies ON and OFF cycle of power relay B is 22 seconds. The relation between indications on the control panel and the output of the microwave oven is as shown in table

NOTE: The ON/OFF time ratio does not correspond with the percentage of microwave power since approximately 2 seconds are required for heating of magnetron filament.

2. Auto Defrost, Auto Reheat, Auto Cook control

When these Auto Control features are selected and the Start Pad is tapped:

(A) The digital programmer circuit determines the power level and cooking time to complete cooking and indicates the operating state in the display window. Table shows the corresponding cooking times for respective serving by categories.

(B) When cooking time in the display window has elapsed, the oven turns off automatically by a control signal from the digital programmer circuit.

POWER SETTING	OUTPUT POWER (%) APPROX.	ON-OFF TIME OF POWER RELAY B (RY1)	
		ON (SEC)	OFF (SEC)
HIGH	100%	22	0
MEDIUM-HIGH	70%	17	5
MEDIUM	55%	13	9
MEDIUM-LOW	30%	8	14
LOW	10%	5	17
DEFROST	30%	8	14

Auto Defrost

SELECTED WEIGHT	COOKING TIME		
	NN-L538BA/WA	NN-L628BA/WA NN-L638BA/WA	NN-L728BA NN-L738BA
1.0 LB	7 min.	7 min.	6 min.20 sec.
6.0 LB	66 min.	51 min.	51 min.30 sec.

Auto Reheat

SELECTED SERVING	COOKING TIME		
	NN-L538BA/WA	NN-L628BA/WA NN-L638BA/WA	NN-L728BA NN-L738BA
1	3 min.	2 min. 30 sec.	2 min. 20 sec.
2	4 min. 30 sec.	3 min. 40 sec.	3 min.
4	7 min.	5 min. 30 sec.	5 min. 30 sec.

Auto Cooking

MENU	SERVING	COOKING TIME		
		NN-L538BA/WA	NN-L628BA/WA NN-L638BA/WA	NN-L728BA NN-L738BA
HOT DOG	3	1 min. 40 sec.	1 min. 20 sec.	1 min. 20 sec.
POTATO	2	8 min. 40 sec.	7 min. 30 sec.	7 min.
FROZ. PIZZA	8oz	4 min. 30 sec.	4 min.	4 min.
POPCORN	3.5 oz	2 min. 40 sec.	2 min. 20 sec.	2 min. 30 sec.

CAUTIONS TO BE OBSERVED WHEN TROUBLESHOOTING

Unlike many other appliances, the microwave oven is high-voltage, high-current equipment. Though it is free from danger in ordinary use, extreme care should be taken during repair.

CAUTION

Servicemen should remove their watches whenever working close to or replacing the magnetron.

1. Check the grounding

Do not operate on a 2-wire extension cord. The microwave oven is designed to be used when grounded. It is imperative, therefore, to make sure it is grounded properly before beginning repair work.

2. Warning about the electric charge in the high voltage capacitor

For about 30 seconds after the oven is turned off, an electric charge remains in the high voltage capacitor.
When replacing or checking parts, remove the power plug from the outlet and short the terminal of the high voltage capacitor (terminal of lead wire from diode) to chassis ground with an insulated handle screwdriver to discharge.

WARNING

There is high-voltage present, with high-current capabilities in the circuits of the high voltage winding and filament winding of the high voltage transformer. It is extremely dangerous to work on or near these circuits with oven energized.
DO NOT measure the voltage in the high voltage circuit including filament voltage of magnetron.

WARNING

Never touch any circuit wiring with your hand nor with an insulated tool during operation.

3. When parts must be replaced, remove the power plug from the outlet.

4. When the 18 Amp fuse is blown due to the operation of short switch:

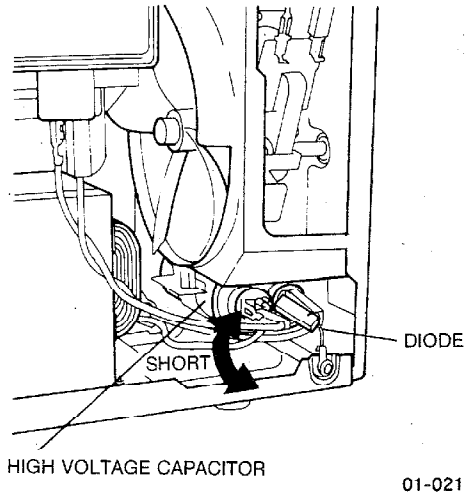
WARNING

When the 18 Amp. fuse is blown due to the operation of the short switch, you must replace power relay B, Primary latch switch and the short switch.

(A) This is mandatory. Refer to "Meausurements and Adjustments" for these switches.
(B) When replacing the fuse, confirm that it has the appropriate rating for these models.
(C) When replacing faulty switches, be sure mounting tabs are not bent, broken or otherwise deficient in their ability to hold the switches.

5. Avoid inserting nails, wire, etc. through any holes in the unit during operation.

Never insert a wire, nail or any other metal object through the lamp holes on the cavity or any other holes or gaps, because such objects may work as an antenna and cause microwave leakage.



Touch chassis side first then short to the high voltage capacitor terminal.

6. Confirm after repair

(A) After repair or replacement of parts, make sure that the screws of the oven, etc. are neither loose nor missing.
Microwaves might leak if screws are not properly tightened.
(B) Make sure that all electrical connections are tight before inserting the plug into the wall outlet.
(C) Check for microwave energy leakage. (Refer to procedure for measuring microwave energy leakage.)

CAUTION

MICROWAVE RADIATION

DO NOT BECOME EXPOSED TO RADIATION FROM THE MICROWAVE GENERATOR OR OTHER PARTS CONDUCTING MICROWAVE ENERGY.

IMPORTANT NOTICE

1. The following components have potentials above 250V while the appliance is operated.
   - ✻ Magnetron
   - ✻ High voltage transformer
   - ✻ High voltage diode
   - ✻ High voltage capacitor

   Pay special attention on these portions.
2. When the appliance is operated with the door hinges or magnetron fixed incorrectly, the microwave leakage can reach more than 5mW/cm^2. After repair or exchange, it is very important to check if magnetron and the door hinges are correctly fixed.

DISASSEMBLY AND PARTS REPLACEMENT PROCEDURE

1. Magnetron

(A) Discharge the high voltage capacitor.
(B) Remove 2 screws holding magnetron thermal cutout.
(C) Remove 1 screw holding air guide A.
(D) Disconnect 2 high voltage lead wires from magnetron filament terminals.
(E) Remove 4 screws holding the magnetron.

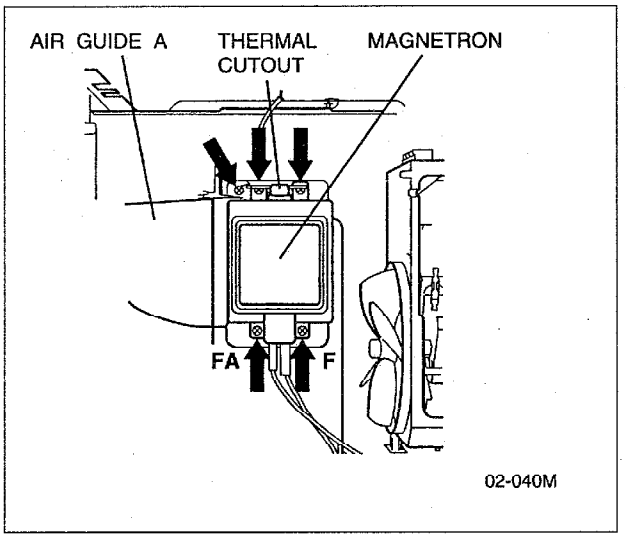
NOTE: After replacement of the magnetron, tighten mounting screws properly making sure there is no gap between the waveguide and the magnetron to prevent microwave leakage.

CAUTION

When replacing the magnetron, be sure the antenna gasket is in place.

CAUTION

When connecting 2 filament lead wires to the magnetron terminals, be sure to connect the lead wires in the correct position. The lead wire of high voltage transformer should be connected to "F terminal" and the lead wire from high voltage capacitor should be connected to "FA terminal".



2. Digital Programmer Circuit (DPC) and membrane key board.

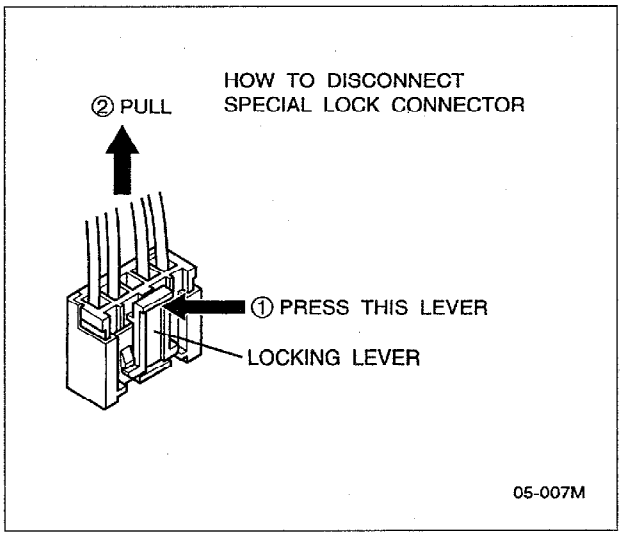
NOTE: Be sure to ground any static electric charge built up on your body before handling the DPC.

(A) Disconnect all connectors from D.P.C.
(B) Remove 2 screw holding escutcheon base and slide the escutcheon base upward slightly.
(C) Release flat cable connector's lock of DPC by pushing both levers to inside and pull them upward, and remove flat cable of membrane key board.
(D) Remove 2 screws holding DPC.

To replace membrane key board

(E) Remove escutcheon bracket from escutcheon base by freeing 4 catch hooks on the escutcheon base.
(F) Push the upper part of key board (display window portion) from back of escutcheon base and peel off escutcheon sheet and membrane key board completely from escutcheon base.

NOTE: 1. The membrane key board is attached to the escutcheon base with double faced adhesive tape. Therefore, applying hot air such as using a hair dryer is recommended for smoother removal.
2. When installing new membrane key board, make sure that the surface of escutcheon base is cleaned sufficiently so that any problems (shorted contacts or uneven surface) can be avoided.
3. Alignment position of membrane key board is as follows (see figure);
Membrane key board: Right and upper edges
Escutcheon sheet: Right and lower edges



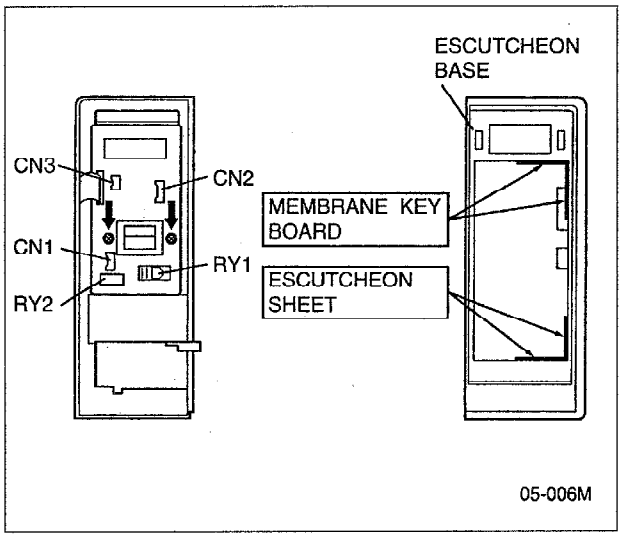
3. Low voltage transformer and/or power relays (RY1, RY2)

NOTE: Be sure to ground any static electric charge built up on your body before handling the DPC.

(A) Using solder wick or a desoldering tool and 30W soldering iron, carefully remove all solder from the terminal pins of the low voltage transformer and/or power relays.

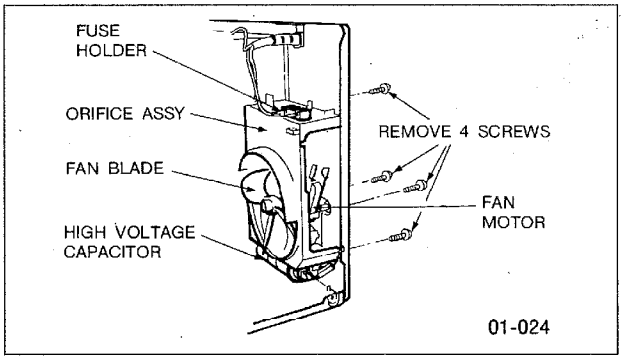
NOTE: Do not use a soldering iron or desoldering tool of more than 30 watts on DPC contacts.

(B) With all the terminal pins cleaned and seperated from DPC contacts, remove the defective transformer/power relays and install new transformer/power relays making sure all terminal pins are inserted completely. Resolder all terminal contacts carefully.



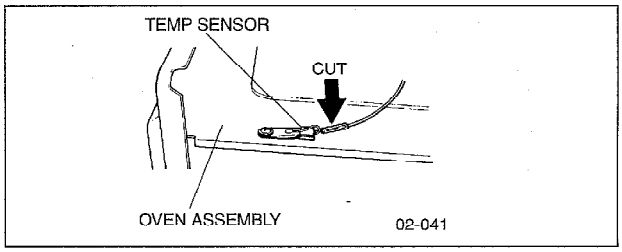
4. Fan motor

(A) Disconnect 2 lead wires from fan motor terminals.
(B) Disconnect 2 lead wires from fuse holder terminals.
(C) Disconnect 4 high voltage lead wires from high voltage capacitor terminals.
(D) Remove 4 screws holding fan motor and orifice assy and detach the orifice assy with fan motor from oven assy.
(E) Remove fan blade from the fan motor shaft by pulling it straight out.
(F) Separate the fan motor from the orifice assy by freeing 2 catch hooks on the orifice assy.



5. Temp sensor (thermal protector)

(A) Cut a lead wire at the top of sensor terminals.
(B) Remove 1 screw holding the temp sensor and replace with new one.
(C) Solder the lead wires securely to the sensor terminals.

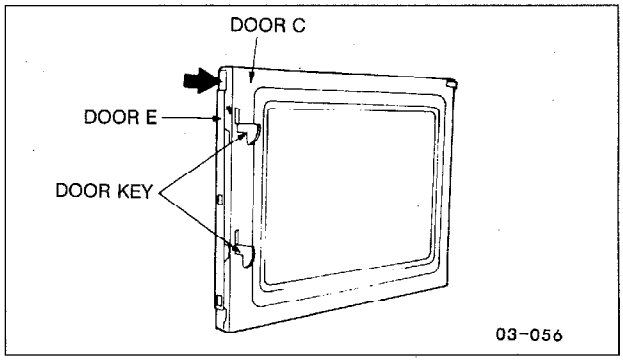


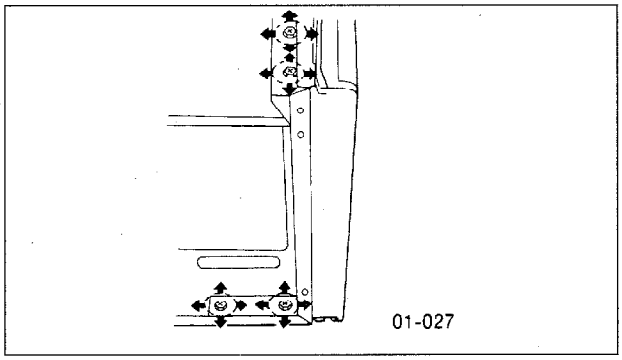
6. Door assembly

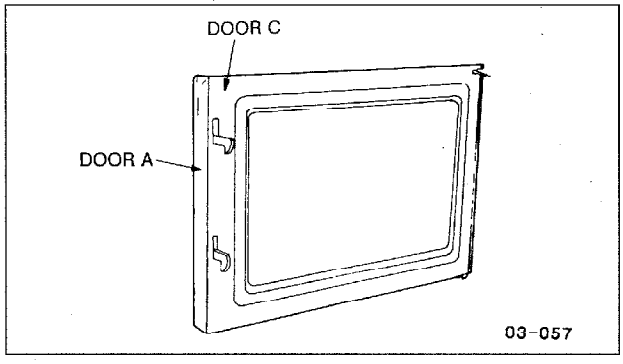
(A) Separate door C by freeing catch hooks using a flat blade screwdriver.
(B) Open the door and remove 2 screws (1.0/1.3 Models), 3 screws (1.7 Models) holding door E to door A.
(C) Separate door A by freeing catch hooks.
(D) Remove door key and door key spring.

After replacment of the defective component parts of the door, reassemble it and follow the instructions below for proper installation and adjustment so as to prevent an excessive microwave leakage.

(1) When mounting the door to the oven, be sure to adjust the door parallel to the bottom line of the oven face plate by moving the upper hinge and lower hinge in the direction necessary for proper alignment.
(2) Adjust so that the door has no play between the inner door surface and oven front surface. If the door assembly is not mounted properly, microwave power may leak from the clearance between the door and oven.
(3) Perform the microwave leakage test.







7. Turntable motor

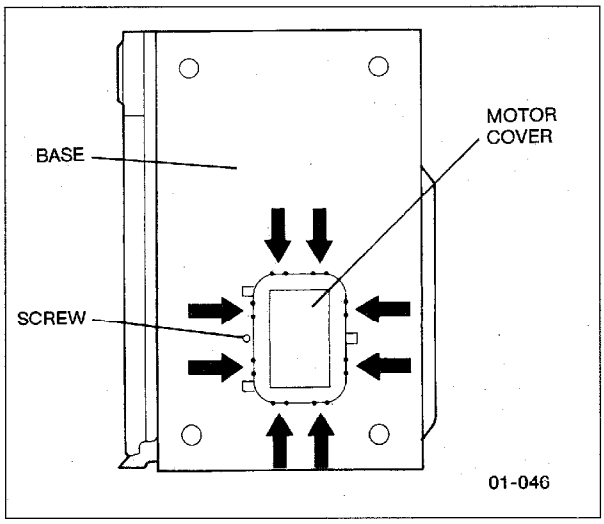
(A) Remove the motor cover by breaking off at the 8 spots indicated by arrows with a cutter or the like. (See Figure)

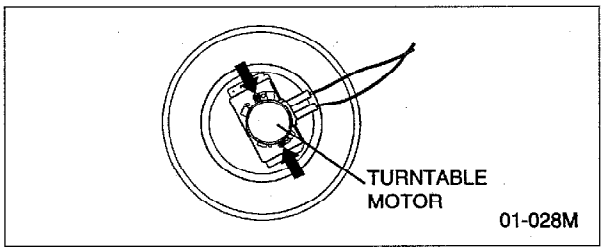
NOTE: After breaking off the motor cover, make sure that cut-off portions are properly trimmed off or bend to inside so that no sharp edge will expose to outside.

(B) Disconnect 2 lead wires connected to the turntable motor.

(C) Remove the turntable motor by removing 2 screws.

NOTE: To reinstall the motor cover, use 4X6 screw.





COMPONENT TEST PROCEDURE

CAUTION

1. High voltage is present at the high voltage terminal of the high voltage transformer during any cook cycle.
2. It is neither necessary nor advisable to attempt measurement of the high voltage.
3. Before touching any oven components, or wiring, always unplug the oven from its power source and discharge the high voltage capacitor.

1. Primary Latch Switch, Secondary (Secondary Latch Switch and Power Relay B) Interlocks.

(A) Unplug the lead connectors to Power Relay B and verify continuity of the power relay B 1-2 terminals.
(B) Unplug lead connectors to Primary Latch Switch and Secondary Latch Switch.
(C) Test the continuity of switches at door opened and closed positions with ohm meter (low scale).
Normal continuity readings should be as follows.

	Door Opened	Door Closed
Primary Latch Switch	∞ Ω (open)	0 Ω (close)
Secondary Latch Switch	∞ Ω (open)	0 Ω (close)
Power Relay B	∞ Ω (open)	∞ Ω (open)

2. Short Switch & Monitor Circuit

(A) Unplug lead wires from H.V. transformer primary terminals.
(B) Connect test probes of ohm meter to the disconnected leads which were connected to H.V. Transformer.
(C) Test the continuity of short switch with door opened and closed positions using lowest scale of the ohm meter.
Normal continuity readings should be as follows.

Door Opened	Door Closed
0 Ω	∞ Ω

3. High voltage transformer

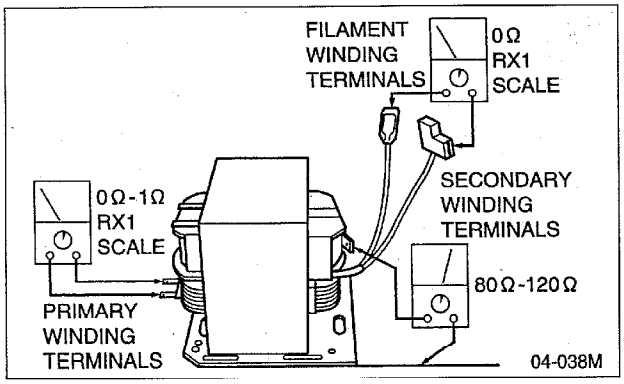
(A) Remove connectors from the transformer terminals and check continuity.
(B) Normal (cold) resistance readings should be as follows:
Secondary winding ..... Approx. 80Ω~120Ω
Filament winding ..... Approx. 0Ω
Primary winding ..... Approx. 0Ω~1Ω

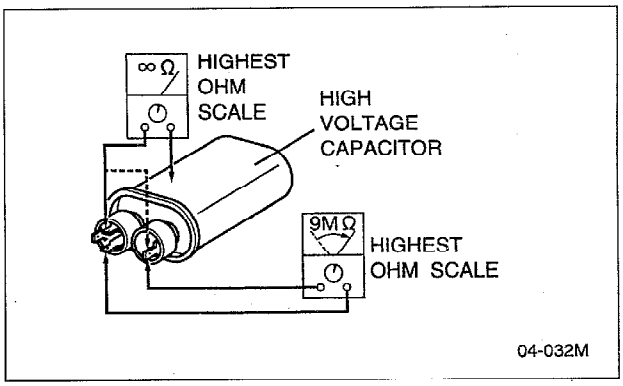
4. High voltage capacitor

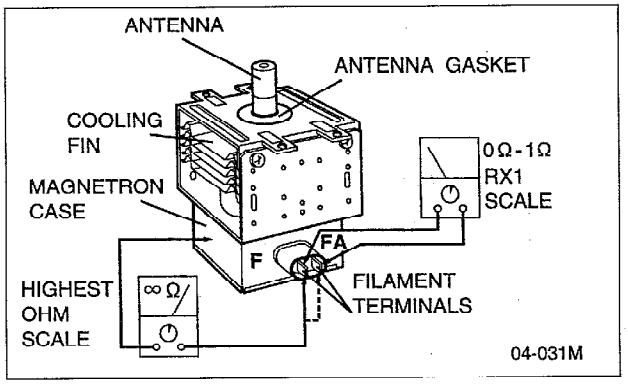
(A) Check continuity of capacitor with meter on highest OHM scale.
(B) A normal capacitor will show continuity for a short time, and then indicate 9MΩ once the capacitor is charged.
(C) A shorted capacitor will show continuous continuity.
(D) An open capacitor will show constant 9MΩ.
(E) Resistance between each terminal and chassis should be infinite.

5. Magnetron

Continuity checks can only indicate an open filament or a shorted magnetron. To diagnose for an open filament or shorted magnetron.
(A) Isolate magnetron from the circuit by disconnecting the leads.
(B) A continuity check across magnetron filament terminals should indicate one ohm or less.
(C) A continuity check between each filament terminal and magnetron case should read open.





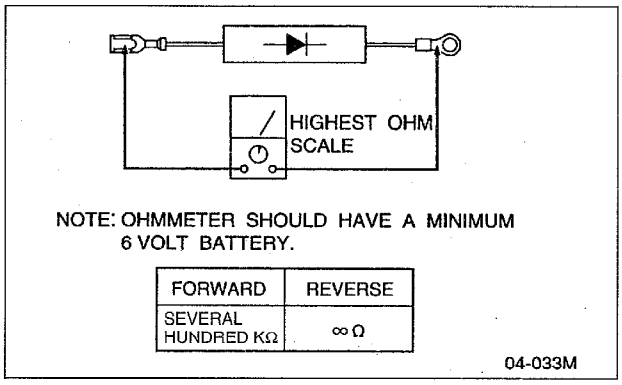


6. Diode

(A) Isolate the diode from the circuit by disconnecting the leads.

(B) With the ohmmeter set on the highest resistance scale, measure the resistance across the diode terminals. Reverse the meter leads and again observe the resistance reading. Meter with 6V, 9V or higher voltage batteries should be used to check the front-to-back resistance of the diode, otherwise an infinite resistance may be read in both directions.

A normal diode's resistance will be infinite in one direction and several hundred KΩ in the other direction.



7. Membrane key board (Membrane switch assembly)

Check continuity between switch terminals, by tapping an appropriate pad on the key board. The contacts assignment of the respective pads on the key board is as shown in digital programmer circuit.

8. Temp sensor (Thermal protector)

A temp sensor is mounted on top of the oven cavity at the left side. Its purpose is to automatically shut off the oven in case the cavity overheats for any reason.

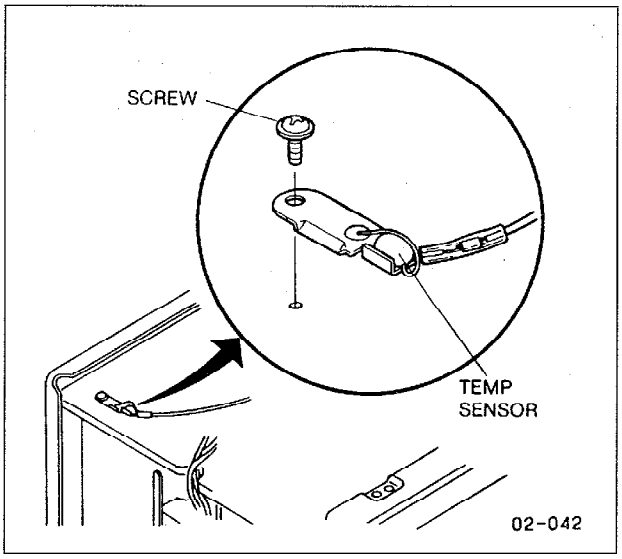
The thermal protector will shut the oven down when the temperature of the oven cavity reaches 257°F (125°C).

The device is connected to the DPC on touch control models. When the thermal protector exceeds its temperature it will turn off the power to oven cavity and display will go to reset mode.

The cooking program can be reset after cool-down.

THERMISTOR RESISTANCE VALUE

30K-120K at 10°C-30°C (50°F-86°F)



MEASUREMENTS AND ADJUSTMENTS

WARNING

* For continued protection against radiation hazard, replace only with identical replacement parts (For touch models Part No. ANE6142-1450, Type No. V-16G-3C26-M for Primary latch switch; Part No. A61425180AP, Type No. L-3C2-2 for Secondary latch switch; Part No. A61785180AP, Type No. L-2C2-2 for short switch and Part No. AEG5J1EG12B/AEG5J1EG18B, Type No. G5J-1-TP for power relay B (RY1)).
* When the 18 Amp. fuse is blown due to the operation of short switch, you must replace power relay B Primary latch switch and short switch. Then follow the adjustment procedures below.
* Interlock switch replacement — In replacing faulty switches, be sure mounting tabs are not bent, broken or otherwise deficient in their ability to hold the switches.
* Refer to schematic diagram to ensure proper connection.

1. Installation of Primary latch switch, Secondary latch switch and Short switch.

(A) When mounting Primary latch switch, Secondary latch switch and short switch to door hook assembly, mount the Primary latch switch, the Secondary latch switch and the short switch to the door hook assembly as shown in the illustration.

NOTE: **No specific adjustment during installation of Primary latch switch, Secondary latch switch and short switch to the door hook is necessary.**

(B) When mounting the door hook assembly to the oven assembly, adjust the door hook assembly by moving it in the direction of arrow in the illustration so that the oven door will not have any play in it. Check for play in the door by pulling the door assembly. Make sure that the latch keys move smoothly after adjustment is completed. Completely tighten the screws holding the door hook assembly to the oven assembly.

(C) Reconnect the short switch, Primary and Secondary latch switches and check the continuity of the monitor circuit and all latch switches again by following the components test procedures.

2. Measurement of microwave output

The output power of the magnetron can be determined by performing IEC standard test procedures. However, due to the complexity of IEC test procedures, it is recommended to test the magnetron using the simple method outlined below.

Necessary Equipment:

*1 liter beaker *Glass thermometer

*Wrist watch or stopwatch

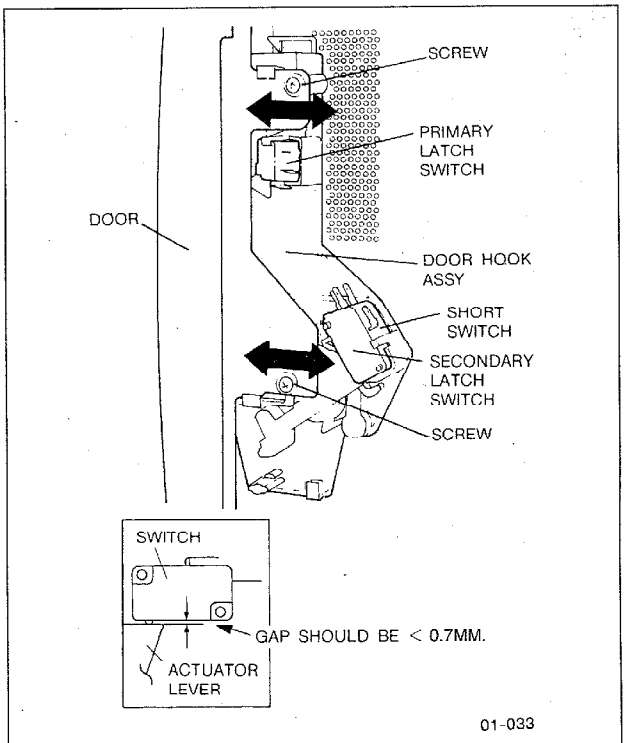
NOTE: **Check the line voltage under load. Low voltage will lower the magnetron output. Take the temperature readings and heating time as accurate as possible.**

(A) Fill the beaker with exactly one liter of tap water. Stir the water using the thermometer and record the beaker's temperature (recorded as T1).

(B) Place the beaker on the center of glass cook plate.
Set the oven for High power and heat it for exactly one minute.

(C) Stir the water again and read the temperature of the beaker (recorded as T2).

(D) The normal temperature rise at High power position for each model is as shown in table.



Please confirm that the gap between the switch housing and switch actuator levers is no more than 0.7 mm when the door is closed.

TABLE (1ℓ-1min. test)

RATED OUTPUT	TEMPERATURE RISE
1000W (IEC705-88)	Min. 15.4°F (8.6°C)

PROCEDURE FOR MEASURING MICROWAVE ENERGY LEAKAGE

WARNING

Check for radiation leakage after every servicing. Should the leakage be more than 2 mW/cm² (1mW/cm² for Canada) inform PASC, PSC, or PCI immediately. After repairing or replacing any radiation safety device, keep a written record for future reference, as required by D.H.H.S. and Health and Welfare Canada regulation. This requirement must be strictly observed. In addition, the leakage reading must be recorded on the service repair ticket while in the customer's home.

NOTE: **The U.S. Government standard is 5 mW/cm² while in the customer's home. 2 mW/cm² stated here is our own voluntary standard. (1 mW/cm² for Canada)**

1. Equipment

*Electromagnetic radiation monitor
*Glass thermometer 212°F or 100°C
*600cc glass beaker

2. Procedure for measuring radiation leakage.

Note before measuring.

(1) Do not exceed meter full scale deflection. Leakage monitor should initially be set to the highest scale.

(2) To prevent false readings the test probe should be held by the grip portion of the handle only and moved along the shaded area shown in Figure no faster than 1 inch/sec (2.5 cm/sec).

(3) Leakage with the outer panel removed ..... less than 5mW/cm².

(4) Leakage for a fully assembled oven with door normally closed..... less than 2mW/cm² (1mW/cm² for Canada).

(5) Leakage for a fully assembled oven [Before the latch switch (primary) is interrupted] while pulling the door..... less than 2mW/cm².

(A) Pour 275 ± 15cc (9ozs ± 1/2oz) of 20 ±5°C (68 ± 9°F) water in a beaker which is graduated to 600cc, and place in the center of the oven.

(B) Set the radiation monitor to 2450MHz and use it following the manufacturer's recommended test procedure to assure correct results.

(C) When measuring the leakage, always use the 2 inch (5cm) spacer supplied with the probe.

(D) Tap the start pad or set the timer and with the magnetron oscillating, measure the leakage by holding the probe perpendicular to the surface being measured.

(1) Measurement with the outer panel removed.

Whenever you replace the magnetron, measure for radiation leakage before the outer panel is installed and after all necessary components are replaced or adjusted. Special care should be taken in measuring around the magnetron.

WARNING

Avoid contacting any high voltage parts.

(2) Measurements with a fully assembled oven.

After all components, including outer panel are fully assembled, measure for radiation leakage around the door periphery, the door viewing window, the exhaust opening and air inlet openings.

3. Record keeping and notification after measurement

(A) After any adjustment or repair to a microwave oven, a leakage reading must be taken. Record this leakage reading on the repair ticket even if it is zero.

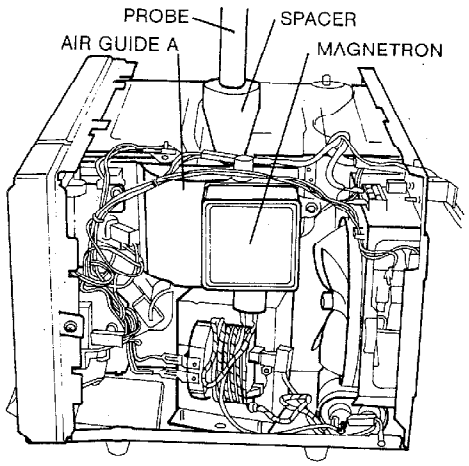
A copy of this repair ticket and the microwave leakage reading should be kept by repair facility.

(B) Should the radiation leakage be more than 2 mW/cm² (1mW/cm² for Canada) after determining that all parts are in good condition, functioning properly, and genuine replacement parts as listed in this manual have been used, immediately notify PASC, PSC or PCI.

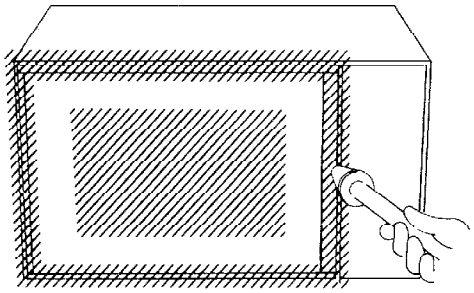
4. At least once a year, have the radiation monitor checked for calibration by its manufacturer.

WARNING

AVOID CONTACTING ANY HIGH VOLTAGE PARTS.



01-034



01-035

MOVE PROBE ALONG SHADED AREA (////) AROUND EXHAUST OPENINGS (as shown) AND AROUND AIR INLET OPENING

TROUBLESHOOTING GUIDE

CAUTION

1. Ensure proper grounding before checking for trouble.
2. Be careful of the high voltage circuitry, taking necessary precautions when troubleshooting.
3. Discharge high voltage capacitor.
4. When checking the continuity of the switches or the high voltage transformer, disconnect one lead wire from these parts and then check continuity with the AC plug removed. To do otherwise may result in a false reading or damage to your meter.
   When disconnecting a plastic connector from a terminal, you must hold the plastic connector instead of the lead wire and then disconnect it, otherwise lead wire may be open or the connector cannot be removed.
5. Do not touch any parts of the circuitry on the digital programmer circuit, since static electric discharge may damage this control panel.
   Always touch yourself to ground while working on this panel to discharge any static charge in your body.
6. 120V AC is present on the digital programmer circuit (Terminals of power relay's and primary circuit of low voltage transformer). When troubleshooting, be cautious of possible electrical shock hazard.

Before troubleshooting, operate the microwave oven following the correct operating procedures in the instruction manual in order to find the exact cause of any trouble, since operator error may be mistaken for the oven's malfunction.

	SYMPTOM	CAUSE	CORRECTIONS
1.	Oven is dead. Fuse is OK. No display and no operation at all.	1. Open or loose lead wire harness. 2. Open thermal cutout (Magnetron) 3. Open low voltage transformer 4. Defective DPC	Check fan motor when thermal cutout is defective.
2.	No display and no operation at all. Fuse is blown.	1. Shorted lead wire harness 2. Defective primary latch switch (NOTE 1) 3. Defective short switch (NOTE 1) 4. Shorted H.V. Capacitor 5. Shorted H.V. Transformer (NOTE 2)	Check adjustment of primary, secondary latch switch and short switch including door.
		NOTE 1: All of these switches must be replaced at the same time. (Refer to adjustment instructions.) Check continuity of power relay B's contacts (between 1 and 2) and if it has continuity, replace power relay B also. NOTE 2: When H.V. Transformer is replaced, check diode and magnetron also.	
3.	Oven does not accept key input (Program).	1. Key input is not in sequence 2. Open or loose connection of membrane key pad to DPC (Flat cable) 3. Shorted or open membrane key board 4. Defective DPC	Refer to operation procedure. Refer to DPC troubleshooting.
4.	Oven lamp and fan motor turn on when oven is plugged in with door closed.	1. Misadjustment or loose wiring of secondary latch switch 2. Defective secondary latch switch	Adjust door and latch switches.
5.	Timer starts countdown but no microwave oscillation. (No heat while oven lamp and fan motor turn on)	1. Off-alignment of latch switches 2. Open or loose connection of high voltage circuit especially magnetron filament circuit NOTE: Large contact resistance will bring lower magnetron filament voltage and cause magnetron to lower output and/or have intermittent oscillation 3. Defective high voltage component H.V. Transformer H.V. Capacitor H.V. Diode Magnetron 4. Open or loose wiring of power relay B 5. Defective primary latch switch 6. Defective power relay B or DPC	Adjust door and latch switches. Check high voltage component according to component test procedure and replace if it is defective. Refer to DPC troubleshooting

	SYMPTOM	CAUSE	CORRECTIONS
6.	Oven can program but timer does not start countdown.	1. Open or loose wiring of secondary latch switch 2. Off-alignment of secondary latch switch 3. Defective secondary latch switch	Adjust door and latch switches.
7.	Microwave output is low. Oven takes longer time to cook food.	1. Decrease in power source voltage 2. Open or loose wiring of magnetron filament circuit. (Intermittent oscillation) 3. Aging change of magnetron	Consult electrician
8.	Fan motor and oven lamp turn on when door is opened.	1. Shorted primary latch switch	Need.
9.	Oven does not operate and return to plugged in mode.	1. Open or loose wiring of temp sensor 2. Defective temp sensor 3. Defective DPC	Check tighten screws on escutcheon base bracket, D.P.C. board and temp sensor.
10.	Loud buzzing noise can be heard.	1. Loose fan and fan motor 2. Loose screws on H.V. Transformer 3. Shorted H.V. Diode	
11.	Turntable motor does not rotate.	1. Open or loose wiring of turntable motor 2. Defective turntable motor	
12.	Oven stops operation during cooking.	1. Open or loose wiring of primary and secondary latch switch 2. Operation of thermal cutout (Magnetron)	Adjust door and latch switches.

Trouble related to Digital Programmer Circuit

SYMPTOM	STEP	CHECK	RESULT	CAUSE/CORRECTIONS
No display when oven is first plugged in. Oven is dead.	1	Fuse pattern of DPC	Normal	STEP 2
			Open (NOTE)	Shorted Circuit of ZNR, L.V.T., Oven Lamp etc. Replace DPC
	2	Low voltage transformer (LVT) secondary voltage	Abnormal 0V	LVT
			Normal	→ Step 3
	3	IC-1 pin 22 voltage (Emitter of Q1)	Abnormal	ZD1, Q1
			Normal = 5V	→ Step 4
	4	IC-1 pin 27 voltage (14 pin of IC-2)	Abnormal	IC-2
			Normal	→ IC-1, CX1

NOTE

Procedure of fuse pattern repairing is as follows:

1. When the fuse pattern (PF2) opens.

(1) Remove the jumper wire (PF1).

(2) Insert the removed jumper wire (PF1) to "(PF2)" position and solder it. If both "PF1" and "PF2" fuse patterns are open, please replace DPC.

2. When the fuse pattern (PF4) opens.

(1) Remove the jumper wire (PF3).

(2) Insert the removed jumper wire (PF3) to "(PF4)" position and solder it. If both "PF3" and "PF4" fuse patterns are open, please replace DPC.

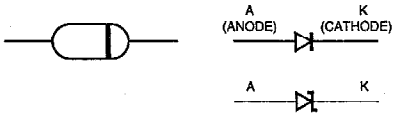
NOTE:* At the time of these repairs, make visual inspection of the varistor for burning damage and examine the transformer with tester for the presence of layer short-circuit (check primary coil resistance).
If any abnormal condition is detected, replace the defective parts.

Trouble related to Digital Programmer Circuit

SYMPTOM	STEP	CHECK	RESULT	CAUSE/CORRECTIONS
No key input	1	Membrane switch continuity	Abnormal	Membrane switch
			Normal	IC-1
No beep sound	1	IC-1 pin 11 voltage	Abnormal	IC-1
			Normal	BZ, Q2
Power relay A(RY-2) does not turn on even though the program has been set and the start pad is tapped	1	IC-1 pin 10 voltage while operation	Abnormal	IC-1,
			Normal = 5V	→ Step 2
	2	short circuit between pin 1 and pin 12 of IC-2	Still not turn on	RY-2
			RY-2 turns on	IC-2
No microwave oscillation at any power setting	1	IC-1 pin 8 and pin 9 voltages while operation at high power	Abnormal	IC-1
			Normal 8---5V, 9---5V	→ Step 2
	2	Q8 translator	Abnormal	Q8
			Normal	IC-2, RY-1
Oven function is OK but no display all digits.	1	IC-3 pin 9 voltage	Abnormal	C11, D11-D14, LVT
			Normal = 9-10V	→ Step 2
	2	Replace display and check operation	Normal	Display
			Still no display	IC-1, IC-3

HOW TO CHECK THE SEMICONDUCTORS USING AN OHM METER

Diode



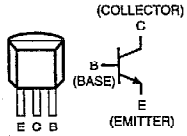
	FORWARD	REVERSE
A-K	SMALL	∞

Transistor

NPN Transistor

2SC·····

2SD·····

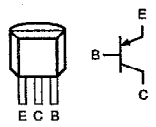


	FORWARD	REVERSE
B-E	SMALL	∞
B-C	SMALL	∞
C-E	∞	∞

PNP Transistor

2SA·····

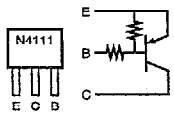
2SB·····



	FORWARD	REVERSE
E-B	SMALL	∞
C-B	SMALL	∞
C-E	∞	∞

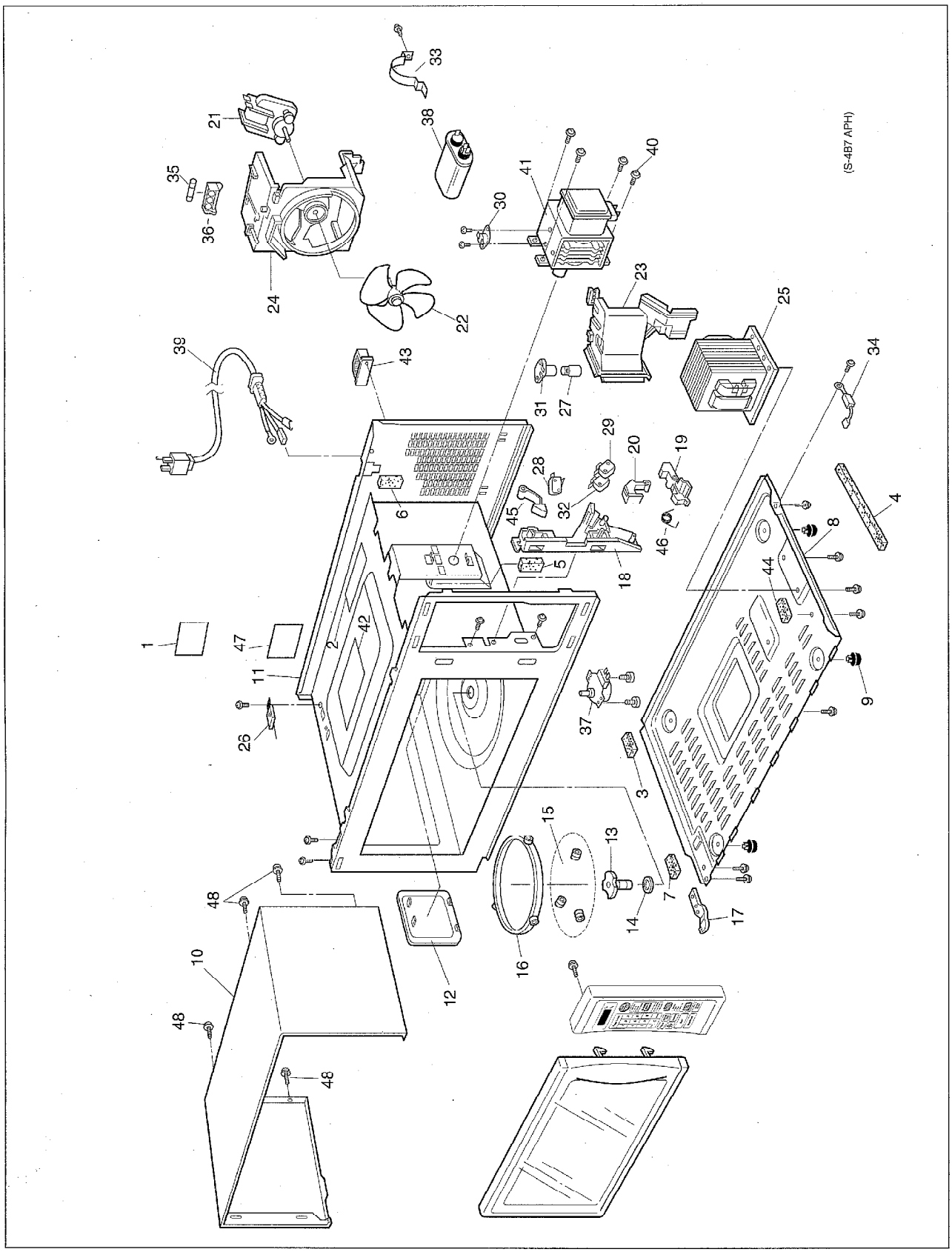
Digital Transistor

PNP Transistor



	FORWARD	REVERSE
E-B	10kΩ~30kΩ	10kΩ~30kΩ
C-B	50kΩ~90kΩ	∞
C-E	40kΩ~80kΩ	∞

EXPLODED VIEW AND PARTS LIST



PARTS LIST

NOTES • When ordering replacement part(s), please use part number(s) shown in this parts list. Do not use description of the part.
- Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
- Items marked * supplied by MMOC (MAC). (U.S.A.)

Ref.No.		Part No.	Part Name & Description	Pcs/Set	Remarks
*1		B00066260AP	CAUTION LABEL	1	
*2		B00338290AP	FUSE LABEL	1	
*3		AMQ0902000BA	CUSHION RUBBER A	1	NN-L628BA/WA, NN-L638BA/WA
*4		AMQ0902000AH	CUSHION RUBBER A	1	
*5		AMQ0908000AE	CUSHION RUBBER A	1	ALL 1.3 & 1.7 MODELS
*6		AMQ0902000FD	CUSHION RUBBER A	1	
*7		AMQ0904000BB	CUSHION RUBBER A	1	NN-L628BA/WA, NN-L638BA/WA
*8		B10018290AP	BASE/1.7	1	NN-L728BA, NN-L738BA
*8		B10018640AP	BASE/1.3	1	NN-L628BA/WA, NN-L638BA/WA
*8		B10018250AP	BASE/1.0	1	NN-L538BA/WA
*9		B10088250AP	RUBBER FOOT	4	
*10		B10097600AP	CABINET BODY/1.7/BLACK	1	NN-L728BA, NN-L738BA
*10		B10097650AP	CABINET BODY/1.3/BLACK	1	NN-L628BA, NN-L638BA
*10		B10097650HAP	CABINET BODY/1.3/WHITE	1	NN-L628WA, NN-L638WA
*10		B10097250AP	CABINET BODY/1.0/BLACK	1	NN-L538BA
*10		B10097250HAP	CABINET BODY/1.0/WHITE	1	NN-L538WA
*11	⚠	B200A4A00AP	OVEN/1.7	1	NN-L728BA, NN-L738BA
*11	⚠	B200A9340AP	OVEN/1.3	1	NN-L628BA/WA, NN-L638BA/WA
*11	⚠	B200A8340AP	OVEN/1.0	1	NN-L538BA/WA
*12		B20557000AP	CEILING COVER WHITE	1	
*13		B21315540AP	PULLEY SHAFT	1	
*14		B21777050AP	WASHER	1	
*15		B202K4650AP	ROLLER B(U)	1	NN-L538BA/WA (NOTE 1)
*15		B202K9330AP	ROLLER B (U)	1	NN-L628BA/WA, NN-L638BA/WA, NN-L728BA, NN-L738BA (NOTE 1)
*16		B290D8940AP	ROLLER RING(U)	1	NN-L538BA/WA
*16		B290D9330AP	ROLLER RING(U)	1	NN-L628BA/WA, NN-L638BA/WA, NN-L728BA, NN-L738BA
*17	⚠	B30077600AP	LOWER HINGE (B)	1	NN-L728BA, NN-L738BA
*17	⚠	B30077050AP	LOWER HINGE (B)	1	NN-L538BA/WA, NN-L628BA/WA, NN-L638BA/WA
*18	⚠	B3020-1480	DOOR HOOK A	1	
*19		B3137-1480	HOOK SPACER B	1	
*20		B3138-1480	HOOK SPACER C	1	
*21		2Z-9D0A.S	FAN MOTOR	1	(120V, 24W, AC, SINGLE PHASE)
*22		B40086260AP	FAN BLADE	1	NN-L538BA/WA, NN-L628BA/WA, NN-L638BA/WA
*22		B40085950AP	FAN BLADE	1	NN-L728BA, NN-L738BA
*23		B40259390AP	AIR GUIDE A	1	
*24		B41447600AP	ORIFICE/1.7	1	NN-L728BA, NN-L738BA
*24		B41447630AP	ORIFICE/1.3	1	NN-L628BA/WA, NN-L638BA/WA
*24		B41448250AP	ORIFICE/1.0	1	NN-L538BA/WA
*25	⚠	B600B8320AP	H.V. TRANSFORMER	1	ALL 1.0 & 1.3 MODELS (1.5 KVA)
*25	⚠	B621C9250AP	H.V. TRANSFORMER	1	NN-L728BA, NN-L738BA (1.5 KVA)
*26		A601L5180AP	TEMP SENSOR	1	
*27		B60307080AP	INCANDESCENT LAMP	1	ALL 1.3 & 1.7 MODELS
*27		B60304740AQ	INCANDESCENT LAMP	1	NN-L538BA/WA
*28	⚠	ANE6142-1450	MICRO SWITCH	1	(V-16G-3C26-M) PRIMARY LATCH SWITCH
*29	⚠	A61425180AP	MICRO SWITCH	1	(L-3C2-2) SECONDARY LATCH SWITCH
*30	⚠	B61456210AP	THERMAL CUTOUT	1	
*31	⚠	B61524740AQ	SOCKET	1	
*32	⚠	A61785180AP	MICRO SWITCH	1	(L-2C2-2)SHORT SWITCH
*33		B61884060AP	CAPACITOR BRACKET	1	

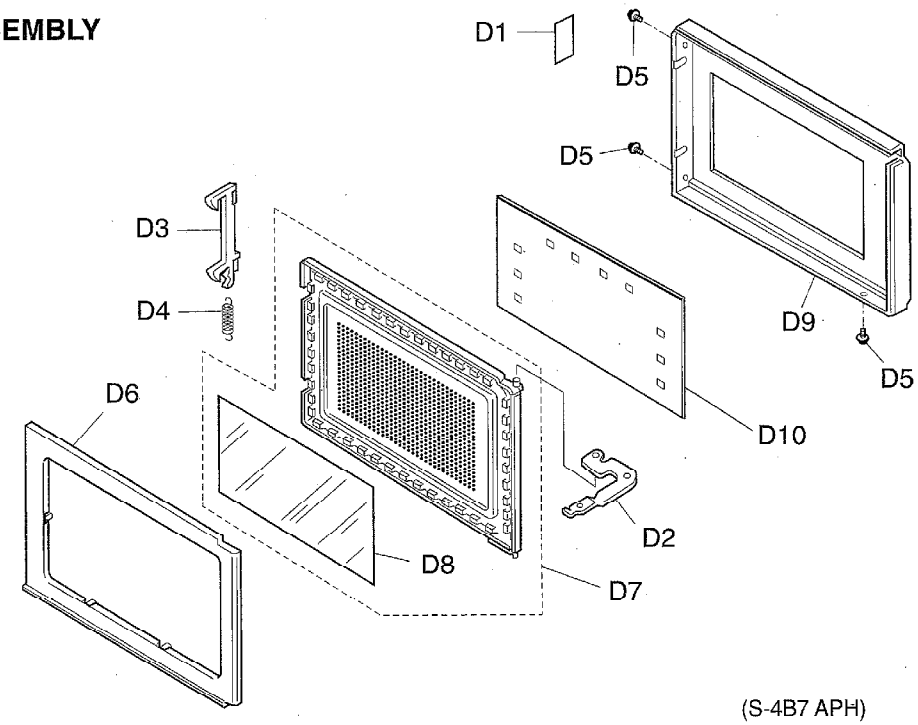
Ref.No.		Part No.	Part Name & Description	Pcs/Set	Remarks
*34	⚠	B62024000AP	DIODE,SI	1	
*35	⚠	B62308250AP	FUSE	1	(18A)
*36		B62314000AP	FUSE HOLDER	1	
*37		B63264080AP	TURNTABLE MOTOR	1	(3W)
*38	⚠	B63907050AP	H.V. CAPACITOR	1	NN-L538BA/WA (1.0μf, AC2100V)
*38	⚠	B60905500AP	H.V. CAPACITOR	1	NN-L628BA/WA, NN-L638BA/WA, NN-L728BA, NN-L738BA (1.0uf, AC2100V)
*39	⚠	B900C9390AP	AC CORD W/PLUG	1	(120V)
*40		XTT4+8B	SCREW	4	(4X8) FOR MAGNETRON
*41	⚠	2M210-M1F1	MAGNETRON	1	
*42		B03478250AP	COVER SHEET	1	
*43		B11408760AP	STOPPER A	1	
*44		AMQ0902000BA	CUSHION RUBBER A	1	NN-L728BA, NN-L738BA
*45		B3136-1480	HOOK SPACER A	1	
*46		J3097-1480	LATCH SPRING	1	
*47		B00064A00AP	WARNING LABEL	1	
*48		XTTANE4T12A	TORX TAMPER RESISTANT SCREW (T20)	4	(NOTE 1A)
		83335A63	TORX TAMPER RESISTANT DRIVER (T20)	1	(NOT SHOWN) (NOTE 1A)
*		B08878640AP	CABINET BODY TOUCH-UP PAINT (BLACK)	1	BOTTLE WITH BRUSH, FOR REPAIR OF PAINTED CABINET BODY
*		B08878640HAP	CABINET BODY TOUCH-UP PAINT (WHITE)		BOTTLE WITH BRUSH, FOR REPAIR OF PAINTED CABINET BODY
*		B08877050AP	CAVITY SPRAY PAINT/1.3	1	SPRAY CAN, FOR REPAIR OF PAINTED OVEN CAVITY
*		B08877000AP	CAVITY TOUCH-UP PAINT/1.3	1	BOTTLE WITH BRUSH, FOR REPAIR OF PAINTED OVEN CAVITY
*		B0887705AAP	CAVITY SPRAY PAINT/1.0/1.7	1	SPRAY CAN, FOR REPAIR OF PAINTED OVEN CAVITY
*		B0887700AAP	CAVITY TOUCH-UP PAINT/1.0/1.7	1	BOTTLE WITH BRUSH, FOR REPAIR OF PAINTED OVEN CAVITY

NOTE 1: When ordering the roller B assy, three rollers will be shipped.
When replacing the roller B, three rollers should be replaced at the same time.
Otherwise the glass cooking tray may not turn smoothly.

NOTE 1A: When repairing unit, special Torx tamper resistant screws are to be removed only by authorized servicers.
To order Torx tamper resistant driver (T20), Part No.83335A63 from supplier, please use the following address.

McMaster-Carr Supply Co.
600 County Line Road
Elmhurst, IL 60126-2081
Mailing Address
P.O. Box 4355
Chicago, IL 60680-4355
Sales & Customer Service Phone No.
(630) 833-0300, FAX (630) 834-9427

DOOR ASSEMBLY

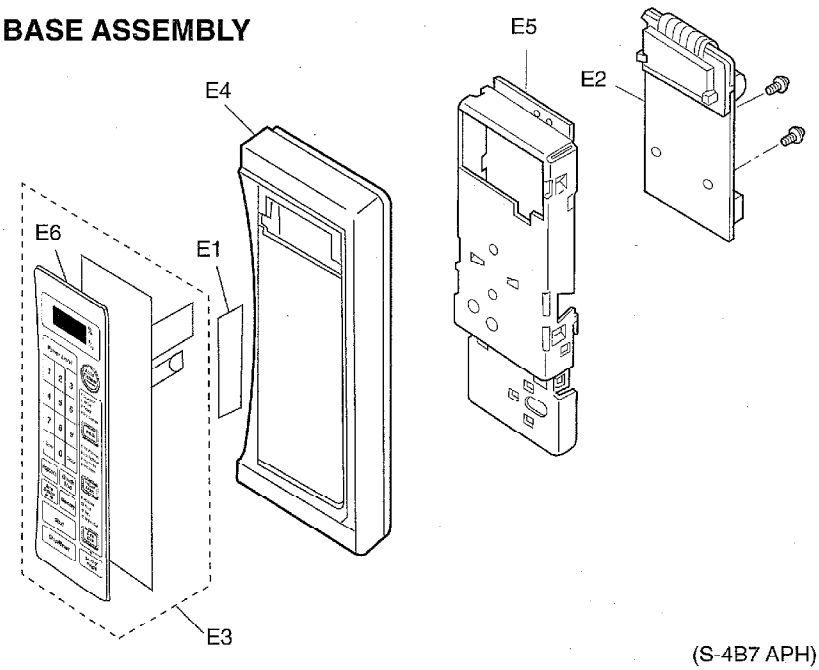


(S-4B7 APH)

Ref.No.		Part No.	Part Name & Description	Pcs/Set	Remarks
*D1		B02454180AP	DHHS LABEL	1	
*D2	⚠	B30067050AP	UPPER HINGE (A)	1	NN-L538BA/WA, NN-L628BA/WA, NN-L638BA/WA
*D2	⚠	B30067600AP	UPPER HINGE (A)	1	NN-L728BA, NN-L738BA
*D3		B3018-1480	DOOR KEY A	1	
*D4		B30214000AP	DOOR KEY SPRING	1	
*D5		XTBANE3+8BZ	SCREW	2	NN-L538BA/WA, NN-L628BA/WA, NN-L638BA/WA
*D5		XTBANE3+8BZ	SCREW	3	NN-L728BA, NN-L738BA
*D6	⚠	B30858340AP	DOOR C / 1.0 BLACK	1	NN-L538BA
*D6	⚠	B30858340HAP	DOOR C / 1.0 WHITE	1	NN-L538WA
*D6	⚠	B30858640AP	DOOR C / 1.3 BLACK	1	NN-L628BA, NN-L638BA
*D6	⚠	B30858640HAP	DOOR C / 1.3 WHITE	1	NN-L628WA, NN-L638WA
*D6	⚠	B30858290AP	DOOR C / 1.7 BLACK	1	NN-L728BA, NN-L738BA
*D7	⚠	B302K8340AP	DOOR E (U) / 1.0 BLACK	1	NN-L538BA
*D7	⚠	B302K8340HAP	DOOR E (U) / 1.0 WHITE	1	NN-L538WA
*D7	⚠	B302K9390AP	DOOR E (U) / 1.3 BLACK	1	NN-L628BA, NN-L638BA
*D7	⚠	B302K9390HAP	DOOR E (U) / 1.3 WHITE	1	NN-L628WA, NN-L638WA
*D7	⚠	B302K8290AP	DOOR E (U) / 1.7 BLACK	1	NN-L728BA, NN-L738BA
*D8	⚠	B31457200AP	DOOR SCREEN A / 1.0	1	NN-L538BA/WA
*D8	⚠	B31457050AP	DOOR SCREEN A / 1.3	1	NN-L628BA/WA, NN-L638BA/WA
*D8	⚠	B31459310AP	DOOR SCREEN A / 1.7	1	NN-L728BA, NN-L738BA
*D9	⚠	B301A8360AP	DOOR A (U) / 1.0 BLACK	1	NN-L538BA (NOTE 2)
*D9	⚠	B301A9500HAP	DOOR A (U) / 1.0 WHITE	1	NN-L538WA (NOTE 2)
*D9	⚠	B301A8670AP	DOOR A (U) / 1.3 BLACK	1	NN-L628BA, NN-L638BA (NOTE 2)
*D9	⚠	B301A9340HAP	DOOR A (U) / 1.3 WHITE	1	NN-L628WA, NN-L638WA (NOTE 2)
*D9	⚠	B301A8310AP	DOOR A (U) / 1.7 BLACK	1	NN-L728BA, NN-L738BA (NOTE 2)
*D10	⚠	B31469410HAP	DOOR SCREEN B / 1.0	1	NN-L538WA
*D10	⚠	B31469330HAP	DOOR SCREEN B / 1.3	1	NN-L628WA, NN-L638WA

NOTE 2: Please order Door A and DHHS Label together.

ESCUTCHEON BASE ASSEMBLY

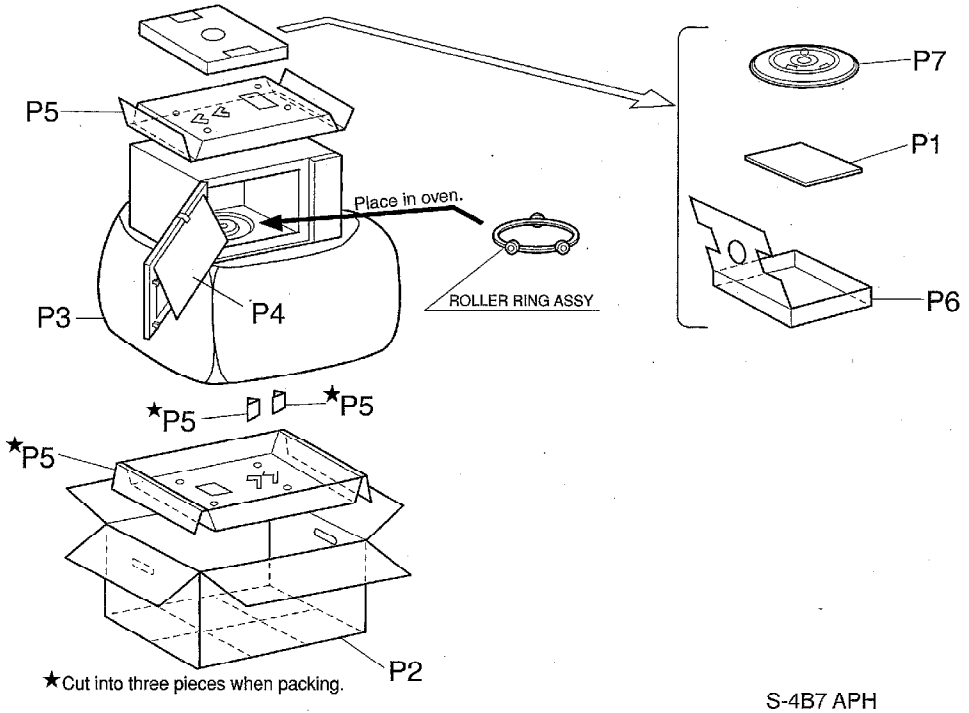


(S-4B7 APH)

Ref.No.		Part No.	Part Name & Description	Pcs/Set	Remarks
*E1		B00078640AP	NAME PLATE	1	
*E2		B603L4A40AP	D.P. CIRCUIT (U)	1	NN-L728BA RTL (W/COMPONENTS)
*E2		B603L4A30AP	D.P. CIRCUIT (U)	1	NN-L738BA RTL (W/COMPONENTS)
*E2		B603L4C70AP	D.P. CIRCUIT (U)	1	NN-L538BA/WA RTL (W/COMPONENTS)
*E2		B603L4B70AP	D.P. CIRCUIT (U)	1	NN-L628BA/WA RTL (W/COMPONENTS)
*E2		B603L4B60AP	D.P. CIRCUIT (U)	1	NN-L638BA/WA RTL (W/COMPONENTS)
*E3		B630Y4B60AP	MEMBRANE SWITCH (U)	1	NN-L538BA, NN-L638BA (W/ ESCUTCHEON SHEET)
*E3		B630Y4B60HAP	MEMBRANE SWITCH (U)	1	NN-L538WA, NN-L638WA (W/ ESCUTCHEON SHEET)
*E3		B630Y4B70AP	MEMBRANE SWITCH (U)	1	NN-L628BA (W/ ESCUTCHEON SHEET)
*E3		B630Y4B70HAP	MEMBRANE SWITCH (U)	1	NN-L628WA (W/ ESCUTCHEON SHEET)
*E3		B630Y4A40AP	MEMBRANE SWITCH (U)	1	NN-L728BA (W/ ESCUTCHEON SHEET)
*E3		B630Y4A30AP	MEMBRANE SWITCH (U)	1	NN-L738BA (W/ ESCUTCHEON SHEET)
*E4		B80348660AP	ESCUTCHEON BASE/BLACK	1	NN-L538BA, NN-L628BA, NN-L638BA (NOTE 3)
*E4		B80348660HAP	ESCUTCHEON BASE/WHITE	1	NN-L538WA, NN-L628WA, NN-L638WA (NOTE 3)
*E4		B80348290AP	ESCUTCHEON BASE/BLACK	1	NN-L728BA, NN-L738BA (NOTE 3)
*E5		B81278640AP	BACK PLATE	1	NN-L538BA/WA, NN-L628BA/WA, NN-L638BA/WA
*E5		B81278290AP	BACK PLATE	1	NN-L728BA, NN-L738BA
*E6		B83374B60AP	ESCUTCHEON SHEET	1	NN-L538BA, NN-L638BA
*E6		B83374B60HAP	ESCUTCHEON SHEET	1	NN-L538WA, NN-L638WA
*E6		B83374B70AP	ESCUTCHEON SHEET	1	NN-L628BA
*E6		B83374B70HAP	ESCUTCHEON SHEET	1	NN-L628WA
*E6		B83374A40AP	ESCUTCHEON SHEET	1	NN-L728BA
*E6		B83374A30AP	ESCUTCHEON SHEET	1	NN-L738BA

NOTE 3: Please order Escutcheon Base and Name Plate together.

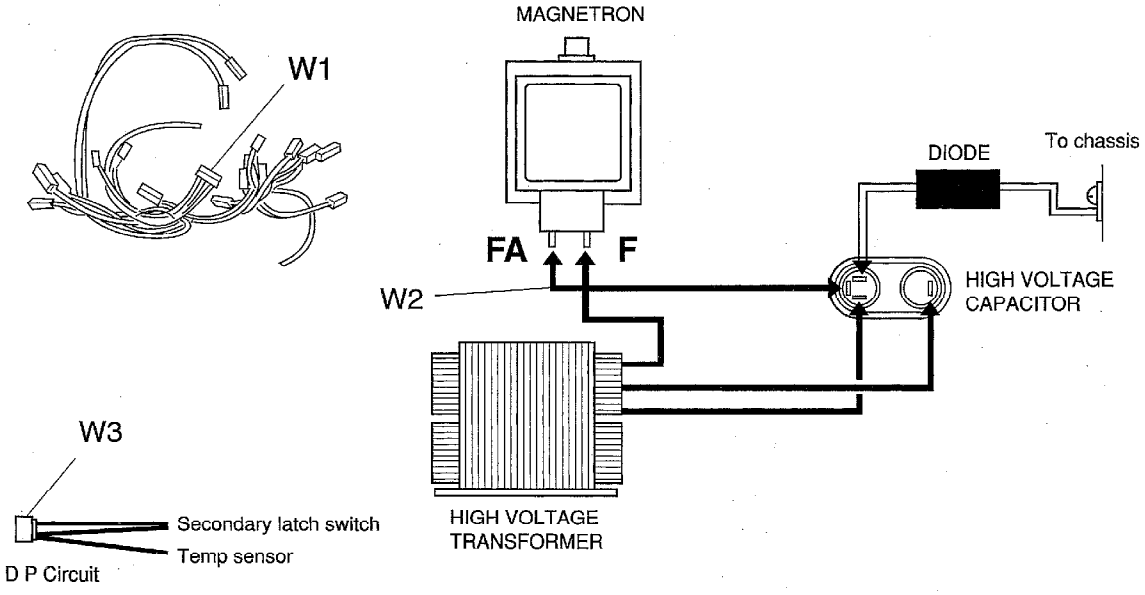
PACKING AND ACCESSORIES



S-4B7 APH

Ref.No.		Part No.	Part Name & Description	Pcs/Set	Remarks
*P1		B00034B6AAP	INSTRUCTION BOOK	1	NN-L538BA/WA, NN-L638BA/WA, NN-L738BA
*P1		B00034B7AAP	INSTRUCTION BOOK	1	NN-L628BA/WA, NN-L728BA
*P2		B010A7730AP	PACKING CASE/PAPER	1	NN-L538BA/WA
*P2		B010A4B70AP	PACKING CASE/PAPER	1	NN-L628BA
*P2		B010A4B70HAP	PACKING CASE/PAPER	1	NN-L628WA
*P2		B010A4B60AP	PACKING CASE/PAPER	1	NN-L638BA
*P2		B010A4B60HAP	PACKING CASE/PAPER	1	NN-L638WA
*P2		B010A4A40AP	PACKING CASE/PAPER	1	NN-L728BA
*P2		B010A4A30AP	PACKING CASE/PAPER	1	NN-L738BA
*P3		B01068340AP	P.E. BAG	1	NN-L538BA/WA
*P3		B01068290AP	P.E. BAG	1	ALL 1.3 & 1.7 MODELS
*P4		B01075640AP	DOOR SHEET	1	NN-L538BA/WA, NN-L628BA/WA, NN-L638BA/WA
*P4		B01077000AP	DOOR SHEET	1	NN-L728BA, NN-L738BA
*P5		B01837000AP	CORRUGATED PACKING	2	NN-L728BA, NN-L738BA
*P5		B01837050AP	CORRUGATED PACKING	2	NN-L628BA/WA, NN-L638BA/WA
*P5		B01837220AP	CORRUGATED PACKING	2	NN-L538BA/WA
*P6		B02214A00AP	UPPER SUPPORT PACKING	1	NN-L728BA, NN-L738BA
*P6		B02218310AP	UPPER SUPPORT PACKING	1	NN-L628BA/WA, NN-L638BA/WA
*P6		B02218260AP	UPPER SUPPORT PACKING	1	NN-L538BA/WA
*P7		A06014000AP	COOKING TRAY	1	NN-L628BA/WA, NN-L638BA/WA
*P7		A06015690QP	COOKING TRAY	1	NN-L538BA/WA
*P7		A06014A00AP	COOKING TRAY	1	NN-L728BA, NN-L738BA

WIRING MATERIALS



(S-4B7 APH)

Ref.No.		Part No.	Part Name & Description	Pcs/Set	Remarks
*W1		B030A7600AP	LEAD WIRE HARNESS	1	
*W2		B03508640AP	LEAD WIRE	1	
*W3		B03537050AP	LEAD WIRE	1	

SERVICE FIXTURES AND TOOLS

EXTENSION CABLES

NOTE: To be used when repairing the DPC board assembly directly on the oven for easy access of the board.

DPC COMMON CHECKER AND ITS CABLE

NOTE: To be used only when DPC common checker is available

Ref.No.		Part No.	Part Name & Description	Pcs/Set	Remarks
		AT40P004	4 pin Extension Cable	1	Cable No. 47
		AT40P005	5 pin Extension Cable	1	Cable No. 46
		AT40E006	1 pinX6 Extension Cable	1	Cable No. 9
		ANE600ZK70AP	DPC. Common Checker	1	
		AT30A7020AP	DPC. Checker Cable	1	NOTE

DIGITAL PROGRAMMER CIRCUIT

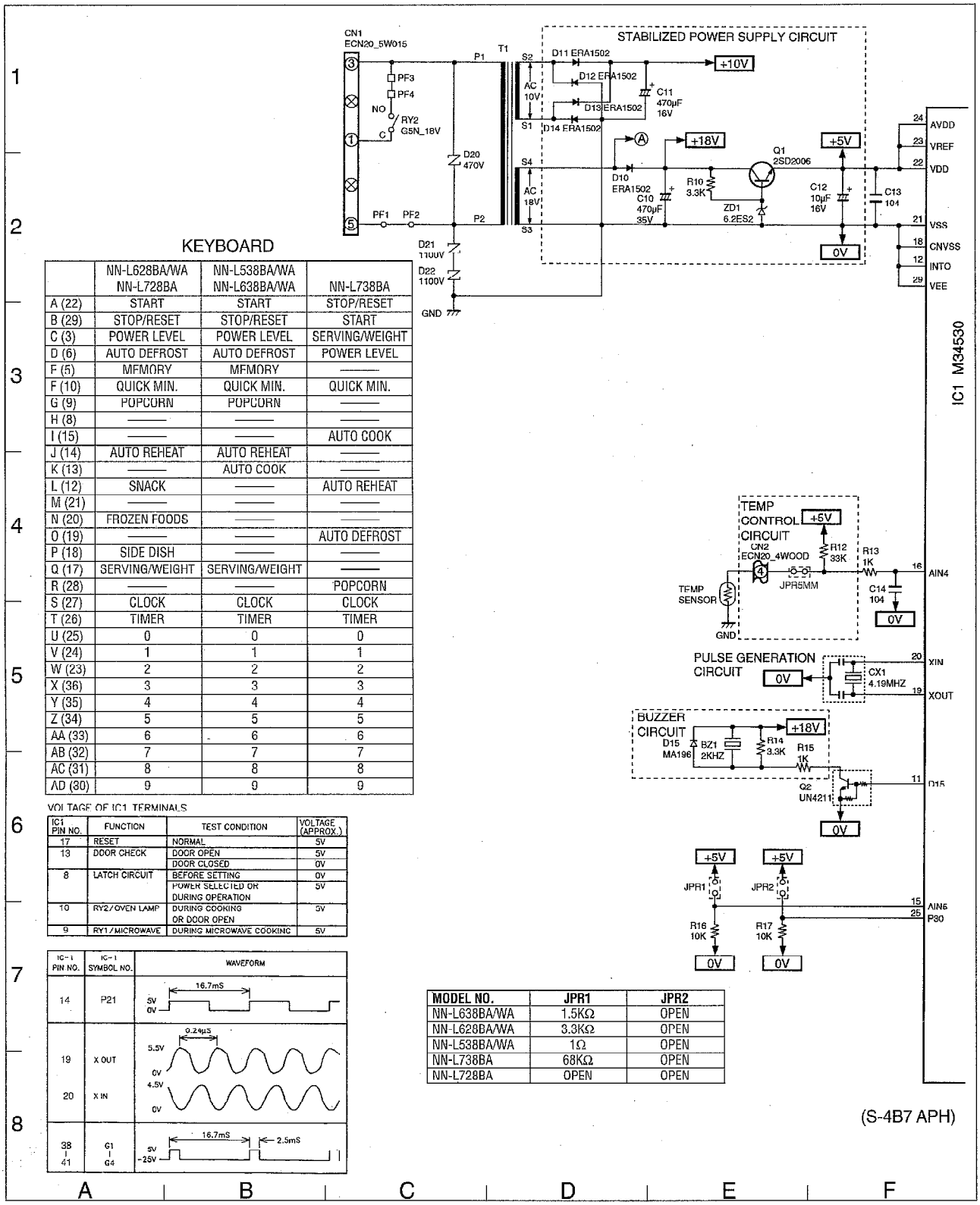
PARTS LIST

Note: Items marked * are supplied by MMOC(MAC). (U.S.A.)

REF No.	PART NO.	DESCRIPTION	QTY	REMARKS
BZ1	AEFB22EP20TL	BUZZER	1	2.0KHz
C10	ECEA1VU471E	ELECTROLYTIC CAPACITOR, AL.	1	470µF/35V/±20%
C11	ECEA1CU471B	ELECTROLYTIC CAPACITOR, AL.	1	470µF/16V/±20%
C12	ECEA1CKA100B	ELECTROLYTIC CAPACITOR	1	10µF/16V/±20%
C13, C14, C15, C17	AECF50F104Z	CERAMIC CAPACITOR	4	0.1µF/50V/-20%+80%
C16, C18, C19, C21, C22, C23	AECBT50F103Z	CERAMIC CAPACITOR	6	0.01µF/25V/-20%+80%
C20	ECEA1HKA2R2B	ELECTROLYTIC CAPACITOR, AL.	1	2.2µF/50V/±20%
CN1	AEEMMF01505W	CONNECTOR	1	5PIN
CN2	AEEMMF00D04W	CONNECTOR	1	4PIN
CN3	AEEM09FDZBTM	CONNECTOR	2	9PIN
CX1	EF0GC4194T4	CERAMIC RESONATOR	1	4.19MHz
D10, D11, D12, D13, D14	AEDNERA1502 (or) AESS1N4003E	DIODE, SI	5	(1A)
D15, D16, D17, D18, D19, D23	MA196-(TA5)	DIODE, SI	6	0.1A
D20	ERZV10D471CS	VARISTOR	1	470 v. d.c.
DISP1, DISP2*	AELNA0414B12	DISPLAY	2	LED
IC1*	AEIC34530084	L.S.I.	1	NN-L538BA/WA
IC1*	AEIC34530076	L.S.I.	1	NN-L628BA/WA NN-L638BA/WA
IC1*	AEIC34530113	L.S.I.	1	NN-L728BA NN-L738BA
IC2*	AN6752	IC	1	
IC3*	AEICKID65004	IC	1	
JPR1	ERD25VJ1R0T	CARBON FILM RESISTOR	1	NN-L538BA/WA 1.0 ohm, 1/4W, ±5%
JPR1	ERD25VJ332T	CARBON FILM RESISTOR	1	NN-L628BA/WA 3.3K ohms, 1/4W, ±5%
JPR1	ERD25VJ152T	CARBON FILM RESISTOR	1	NN-L638BA/WA 1.5K ohms, 1/4W, ±5%
JPR1	ERD25VJ683T	CARBON FILM RESISTOR	1	NN-L738BA 68K ohms, 1/4W, ±5%
Q1	2SD2006QRTA	TRANSISTOR, SI, 1.2W	1	120MHz
Q2	UN4211-(TA)	TRANSISTOR, SI	1	
Q3, Q4, Q5, Q6	2SD2259-(TA)	TRANSISTOR, SI	4	
Q7	UN4219-(TA)	TRANSISTOR, SI	1	
Q8	2SD1991AQSTA	TRANSISTOR, SI, 400MW	1	150MHz
Q11	UN4111-(TA)	TRANSISTOR, SI	1	EXCEPT NN-L728BA
R10, R14	ERDS2TJ332T	CARBON FILM RESISTOR	2	3.3K ohms, 1/4W, ±5%
R11, R16, R17, R18, R42	ERDS2TJ103T	CARBON FILM RESISTOR	5	10K ohms, 1/4W, ±5%
R12	ERDS2TJ333T	CARBON FILM RESISTOR	1	33K ohms, 1/4W, ±5%
R13, R15	ERDS2TJ102T	CARBON FILM RESISTOR	2	1K ohms, 1/4W, ±5%
R19, R20, R21, R22	ERDS2TJ331T	CARBON FILM RESISTOR	4	330 ohms, 1/4W, ±5%
R40	ERDS2TJ242T	CARBON FILM RESISTOR	1	2.4K ohms, 1/4W, ±5%
R23, R24, R25, R26, R27, R28, R29, R30	ERDS2TJ680T	CARBON FILM RESISTOR	8	68 ohms, 1/4W, ±5%
RY1	AEG5J1EM12B ⚠	POWER RELAY	1	(12V)
RY2	AEBGG5N1A18 ⚠	POWER RELAY	1	(18V)
T1	ETP41KCN41UU ⚠	L.V. TRANSFORMER	1	
ZD1	AEDZ6R2ES2T1	DIODE, SI		

DIGITAL PROGRAMMER CIRCUIT (NN-L538BA/WA, NN-L628BA/WA, NN-L638BA/WA, NN-L728BA, NN-L738BA)

SCHEMATIC DIAGRAM



KEYBOARD

	NN-L628BA/WA NN-L728BA	NN-L538BA/WA NN-L638BA/WA	NN-L738BA
A (22)	START	START	STOP/RESET
B (29)	STOP/RESET	STOP/RESET	START
C (3)	POWER LEVEL	POWER LEVEL	SERVING/WEIGHT
D (6)	AUTO DEFROST	AUTO DEFROST	POWER LEVEL
F (5)	MEMORY	MEMORY	———
F (10)	QUICK MIN.	QUICK MIN.	QUICK MIN.
G (9)	POPCORN	POPCORN	———
H (8)	———	———	———
I (15)	———	———	AUTO COOK
J (14)	AUTO REHEAT	AUTO REHEAT	———
K (13)	———	AUTO COOK	———
L (12)	SNACK	———	AUTO REHEAT
M (21)	———	———	———
N (20)	FROZEN FOODS	———	———
O (19)	———	———	AUTO DEFROST
P (18)	SIDE DISH	———	———
Q (17)	SERVING/WEIGHT	SERVING/WEIGHT	———
R (28)	———	———	POPCORN
S (27)	CLOCK	CLOCK	CLOCK
T (26)	TIMER	TIMER	TIMER
U (25)	0	0	0
V (24)	1	1	1
W (23)	2	2	2
X (36)	3	3	3
Y (35)	4	4	4
Z (34)	5	5	5
AA (33)	6	6	6
AB (32)	7	7	7
AC (31)	8	8	8
AD (30)	9	9	9

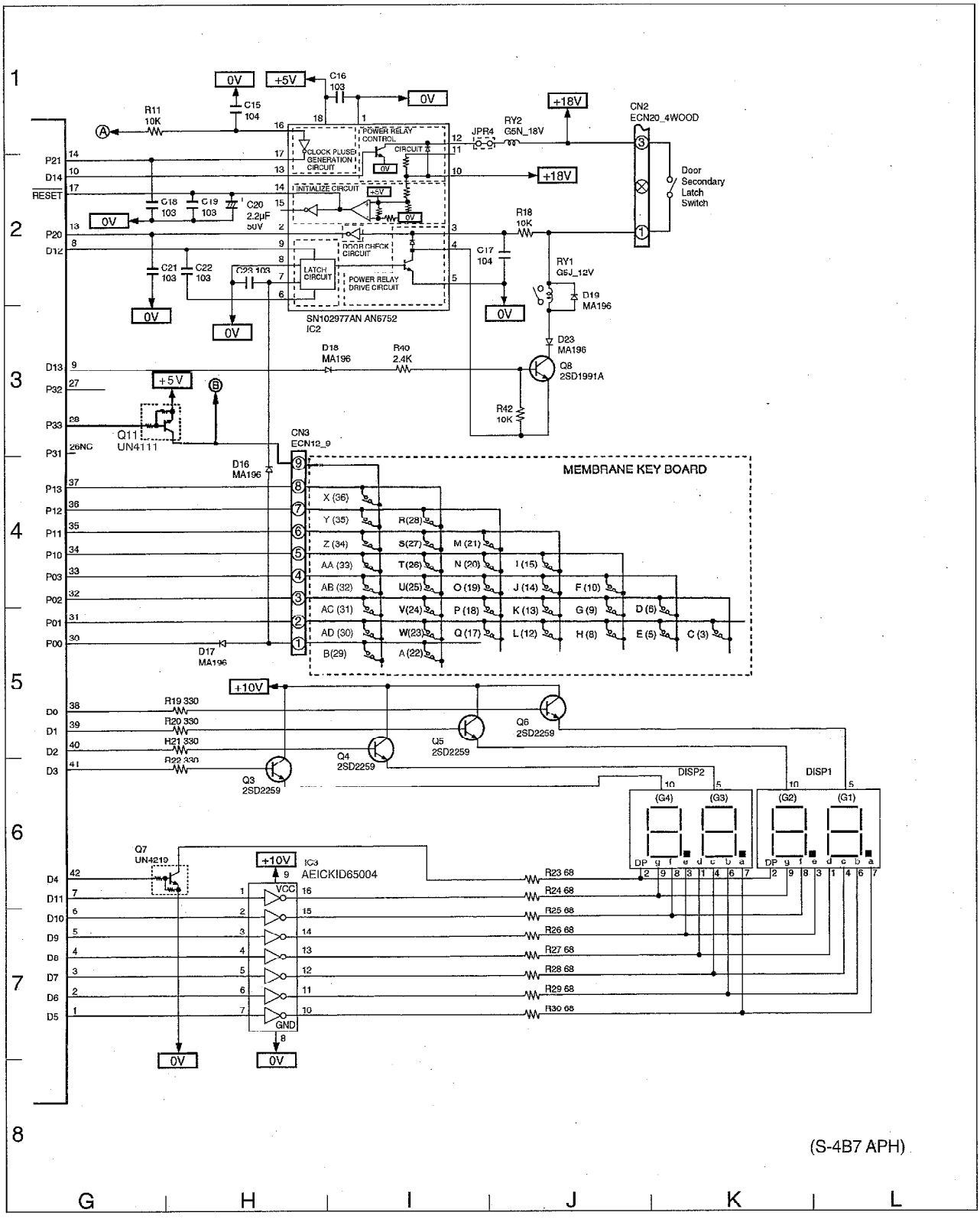
VOLTAGE OF IC1 TERMINALS

IC1 PIN NO.	FUNCTION	TEST CONDITION	VOLTAGE (APPROX.)
17	RESET	NORMAL	5V
13	DOOR CHECK	DOOR OPEN	5V
		DOOR CLOSED	0V
8	LATCH CIRCUIT	BEFORE SETTING	0V
		POWER SELECTED OR DURING OPERATION	5V
10	RY2/OVEN LAMP	DURING COOKING OR DOOR OPEN	5V
9	RY1/MICROWAVE	DURING MICROWAVE COOKING	5V

IC-1 PIN NO.	IC-1 SYMBOL NO.	WAVEFORM
14	P21	16.7mS, 5V, 0V
19	X OUT	0.24µS, 5.5V, 0V
20	X IN	4.5V, 0V
38 I 41	G1 I G4	16.7mS, 2.5mS, 5V, -25V

MODEL NO.	JPR1	JPR2
NN-L638BA/WA	1.5KΩ	OPEN
NN-L628BA/WA	3.3KΩ	OPEN
NN-L538BA/WA	1Ω	OPEN
NN-L738BA	68KΩ	OPEN
NN-L728BA	OPEN	OPEN

(S-4B7 APH)


0V
+5V
C16 103
C15 104
R11 10K
+18V
CN2 ECN20_4WOOD
RY2 G5N_18V
JPR4
POWER RELAY CONTROL CIRCUIT
CLOCK PLUSE GENERATION CIRCUIT
INITIALIZE CIRCUIT
DOOR CHECK CIRCUIT
LATCH CIRCUIT
POWER RELAY DRIVE CIRCUIT
SN102977AN AN6752
IC2
Door Secondary Latch Switch
RESET
C18 103
C19 103
C20 2.2µF 50V
C21 103
C22 103
C23 103
R18 10K
C17 104
RY1 G5J_12V
D19 MA196
D23 MA196
Q8 2SD1991A
D18 MA196
R40 2.4K
R42 10K
Q11 UN4111
CN3 ECN12_9
D16 MA196
D17 MA196
MEMBRANE KEY BOARD
X (36)
Y (35)
Z (34)
AA (33)
AB (32)
AC (31)
AD (30)
B(29)
R(28)
S(27)
T(26)
U(25)
V(24)
W(23)
A (22)
M (21)
N (20)
O (19)
P (18)
Q (17)
I (15)
J (14)
K (13)
L (12)
F (10)
G (9)
H (8)
D (6)
E (5)
C (3)
+10V
R19 330
R20 330
H21 330
R22 330
Q3 2SD2259
Q4 2SD2259
Q5 2SD2259
Q6 2SD2259
DISP2
DISP1
(G4)
(G3)
(G2)
(G1)
DP g f e d c b a
Q7 UN4219
IC3 AEICKID65004
VCC
GND
R23 68
R24 68
R25 68
R26 68
R27 68
R28 68
R29 68
R30 68
(S-4B7 APH)